The Chemical Age

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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A Friendly Word to Germany

THE German people have shown since the war a remarkable power of recovery, and the principal factor in that recovery has undoubtedly been the strength and resources of Germany's great chemical industry. It may be well, therefore, that the heads of the German chemical industry should know how recent developments in Germany are viewed by outsiders. An attempt has been made by certain English journals to inflame public opinion in this country by suggesting serious thoughts of revolution in Germany, and the effect upon German credit here and elsewhere has been distinctly unfavourable. The German people would be making a grave mistake if they assumed the excited writing in some of our daily journals to be representative of English public opinion. The best opinion in this country is in favour of a steady German recovery, not merely because that recovery is being won by hard team work, but because anything like a collapse in Germany would have disastrous reactions throughout Europe and indeed far beyond. From the selfish as well as from the friendly point of view, therefore, Germany may be assured that feeling in this country is becoming increasingly friendly.

At the same time the leaders of German chemical industry, whose influence counts for so much in the industrial and economic life of their country, will realise that such speeches as those of Hitler, whatever value may be attached to them in Germany, have an unsettling effect on other friendly nations. Before the war, when Germany was winning her way by the efficiency of her commercial and scientific organisation, her success was not begrudged. Had she continued on those lines she would have been assured of a great future. But impatience, military ambition, and a few other influences dictated a shorter cut, which ended in disaster for Germany and more or less for the rest of the world. Outsiders see something of the same thing in the present situation. Germany once more is recovering as the result of the qualities that secured her pre-war prosperity. Steadily she is regaining a place among the nations. As against all this, the Hitler policy represents to outsiders the impatience of the old Junker party with peaceful orderly progress, a tendency once more to put faith in force, to override treaty obligations that stand in the way. These words are written in a friendly spirit that they may catch the eye of the heads of Germany's great chemical interests, and convey to them the wish of their English colleagues to see the new Germany keep to the right paths and avoid the pit into which she was led by the militarist leaders of a past generation.

Senseless Duties on Advertising

BRITISH traders of every class, and especially chemical firms anxious to maintain and develop their already large overseas export trade, will learn with interest and approval that a strenuous effort is to be made at the forthcoming Imperial Conference to secure the abolition of the present Customs duties on advertising matter entering the Dominions from Great Britain. Without providing any substantial revenue to any Dominion or protecting any of its domestic industries, the obvious effect of these duties is to restrict commercial information and hamper trade between this country and Dominion markets. At a time when everyone is talking of the vital importance of developing inter-imperial trade and when the recovery of our declining export business is of the first importance, it is difficult to understand the mentality of a policy that restricts the information of the Dominion consumer about the products he may obtain from the home manufacturer. It limits the choice of the Dominion buyer just as much as it limits the selling power of the home producer.

In an interview on the subject in the *Daily Telegraph*, Sir Ernest Benn puts the case for abolition in terms clear enough to penetrate even into the departmental mind. There cannot, he points out, be the faintest suggestion that a limitation imposed on the importing of catalogues and price lists promotes employment in

any part of the Empire, or that a tax on an imported catalogue helps the catalogue-making trade of any country. It is therefore useless from the point of view of "protection." "All," Sir Ernest states, "it can promote is ignorance everywhere of Empire goods—an ignorance which often sends Australia to America, or South Africa to Germany, for goods which can be bought better in Canada or Great Britain. Those who want to raise revenue by taxing imported goods anywhere will never get that revenue until the buyer somehow or other has acquired a knowledge of the goods which he subsequently imports. Every party agrees on the wisdom of promoting the maximum amount of knowledge in every part of the Empire of the doings of every other part. The Imperial Conference has a great chance to do a very big thing in a very simple way. It is no use introducing slight modifications into elaborate and complicated tariff schedules, as was done at the last conference. What is wanted is a bold and definite declaration that there shall be no hindrances to the free interchange of information between all the citizens of the Empire." Merely pedantic variation of the restrictions is no good. The vexatious entanglements must go. A declaration by the Imperial Conference in favour of this sensible and, indeed, obvious course would be a welcome incentive to every manufacturer and merchant to begin pushing trade.

Two Points for Industry

SIR WALTER RAINE, in his presidential address to the autumnal meeting of the Association of British Chambers of Commerce at Birmingham last week, emphasised two points of considerable importance to all engaged in trade. The first was the danger which tempts many an employer to cut down remorselessly his working expenses on every side without thinking of the possible damage to his trade organisation. What he had in mind particularly was advertising, which so many firms still regard mistakenly as a luxury, instead of as a first necessity of business. "In these bad times," he said, "instead of cutting down expenses in every direction, employers should rather increase their account for advertising, as by so doing they increase their business." It is sound advice. Just as a weakened patient needs the best possible nutrition, so business, weakened by general depression and lack of confidence, needs more than ever the help that publicity gives in securing trade. To deprive it of such a tonic when it most needs it is to increase its weakness and to diminish, not only its present vigour, but what is perhaps even more important, its power, when conditions begin to improve, of taking immediate advantage of the improvement.

Sir Walter Raine's second point was not less relevant to the present situation. It was a plea for the discarding of our present luxurious notions about industry and a return to the wholesome old-fashioned remedy of hard work. Instead of thinking continually in terms of short working hours, longer holidays, and more pay, "what we want," he declared, "is more work and, instead of talking about fewer hours and more pay, let us not place obstacles in the way of carrying out efficiently such work as we may obtain." The countries that are recovering most quickly from the war are those where the nation as a whole has settled down to work, realising that past losses can only be paid for in that way. Those countries that have presumed that such losses can be made good without sacrifice, and have sought for easier and easier conditions of life, have a plain lesson to learn. Public economy is becoming the clamant need of this country. Neither nationally nor as individuals can we continue to live at a rate of expenditure far exceeding our rate of income. Retrenchment was a good motto in the old days, and never was it more needed than to-day.

Books Received

REPORT OF THE COMMITTEE ON WELDED CONTAINERS. Department of Scientific and Industrial Research. London: H.M. Stationery Office. Pp. 52. 1s. 3d.

CHEMISTRY OF FAMILIAR THINGS. By Samuel Schmucker Sadtler. London: J. B. Lippincott Company. Pp. 342. 15s.

MODERN SEWAGE DISPOSAL AND HYGIENICS. By S. H. Adams. London: E. and F. Spon, Ltd. Pp. 474. 25s.

A CATALOGUE OF BRITISH SCIENTIFIC AND TECHNICAL BOOKS. By the British Science Guild. London: A. and F. Denny. Pp. 754. 20s.

ANNUAL REPORT OF THE CITY ANALYST FOR THE YEAR 1929. By H. E. Monk. Pp. 30.

ANALYTICAL CHEMISTRY. Based on the German Text of E. P. Treadwell, translated and revised by W. T. Hall. Vol. I. Qualitative Analysis. London: Chapman and Hall, Ltd. Pp. 610. 23s.

GENERAL CHEMISTRY. By Horace G. Deming. London: Chapman and Hall, Ltd. Pp. 715. 17s. 6d.

ECONOMIC CONDITIONS IN JAPAN TO JUNE 30, 1930. Report by G. B. Sansom, and H. A. Macrae. Department of Overseas Trade. London: H.M. Stationery Office. Pp. 98. 2s. 6d.

The Calendar

Oct.		
6	Chemical Engineering Group: Joint Meeting with the Society of Chemical Industry (London Section), "Recent Results in Structure Research of Colloids in Science and Industry." Dr. Ernst Hauser. 8 p.m.	Institution of Civil Engineers, Great George Street, London.
6	Institute of Metals (Scottish Section): Aluminium Review and Visit of Richard Seligman. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
6	Institution of the Rubber Industry: "The Desirable Properties of Synthetic Compositions for Industrial Purposes." W. D. Owen. 7.30 p.m.	Arts Theatre Club, Great Newport Street, London.
6	Iron and Steel Institute: Additional Autumn Meeting. 7.30 p.m.	Cleveland Technical Institute, Middlesbrough.
7	Iron and Steel Institute: Additional Autumn Meeting. 7.30 p.m	Metallurgical Club, Sheffield.
7	Iron and Steel Institute: Additional Autumn Meeting. 7 p.m.	Secondary Schools, Doncaster Road, Scunthorpe.
8	Institution of Chemical Engineers: "The Effect of Surface Conditions on Heat Transmission." Saral J. Kohli. 8 p.m.	Burlington House, Piccadilly, London.
8	Sir John Cass Technical Institute: Inaugural Ceremony, Session 1930-31. Address by Sir John Gilbert. 8.15 p.m.	Jewry Street, Aldgate, London.
8	Television Society: "Some Developments in Television Based on Quantitative Analysis." J. H. Owen Harries. 7 p.m.	University College, London.
10	Institute of Metals (Sheffield Section): Conjoint Meeting for the Sixth "Sorby" Lecture. 7.30 p.m.	University, Sheffield.
10	Iron and Steel Institute: Additional Autumn Meeting. 7 p.m.	Royal Metal Exchange, Swansea.

Report on Bibby Works Explosion

Type Never Known Before

A REPORT on the silo explosion at the seed crushing works of J. Bibby and Sons, Ltd., on May 5 last, when eleven men were killed and thirty-two others injured, has just been issued by Mr. Henry J. Peacock, Deputy Superintending Inspector of Factories, Liverpool, and Mr. L. C. M'Nair, Engineer Inspector of Factories, Home Office. They state that the explosion occurred in a plant used only for storage and though there was, no doubt, a dust explosion, the conditions were entirely different from those obtaining in any previous explosion known to have occurred in this country.

The four silos concerned in the explosion contained, it is stated, rangoon rice bran, parboiled rice bran, sunflower seed cake, and soya bean meal. So far as could be ascertained, it had not been customary in this country to use silos for storing such materials. One of the reasons for doing so was because it was thought that there would be less danger of spontaneous combustion if the materials were stored in this way rather than in bags.

The evidence of the firemen was to the effect that during the period from the Friday night to the Monday morning, prior to the explosion, there was from time to time, evidence of fire at the top of the column of four silos. The fire appeared to have been put out completely by daybreak on Monday, but there was a further outbreak at 9.30 that morning.

Causes of Explosion

The inspectors express the view that the explosion may have been due to one of two causes. "It may be," they state, "that when silo No. 3 was being slowly emptied, some of the material formed a bridge on the cross spreader beams and later on, when the material below, which was burning, had dropped some considerable distance, the bridge material collapsed and, in falling, produced a dust cloud which was ignited by the fire below—the dust of parboiled rice bran is explosive."

The other possible explanation was that "when the material began to burn, in a limited amount of air, some carbon monoxide was evolved. Part of this would probably be burnt, but some may have escaped unburnt into the mass of material inside the silo. The falling of the material in the silo may have eventually caused the gas to be diluted with air, and, when this mixture was ignited, the resultant small explosion raised a dust cloud which was in turn ignited with a more violent secondary explosion."

"We think that the amount of inflammable gas, if formed as suggested above, could not have been very great, because before such a mixture could explode, it would have to contain (in the case of carbon monoxide) at least 12 per cent. of that gas. If such a mixture had been present in quantity in the silo there must, we consider, have been evidence of 'gassing' among the men working on the top floor."

The second explosion was possibly due to dust being blown up from some of the other silos by the first explosive wave.

Methods of Prevention

Several methods of preventing such accidents had been suggested by the inspectors to the firm who had agreed to experiment in these directions. These included (1) The separating of silos from each other either by adequate air space or by the use of heat insulating material. (2) The continuation of the silos through the roofs with the tops covered by light covers which would lift in case of an explosion and allow the flame to pass to open air without danger to men working on the floor below.

The possibility is suggested of dealing with a fire in a silo by installing tubes fitted with fusible plugs connected to a carbon dioxide or other inert gas pressure supply, so that in case of any rise in temperature an escape of gas sufficient to extinguish the fire in the zone affected will take place.

The provision of recording thermometers on the silos is also suggested.

The firm, it is understood, are considering the desirability of shortening the silos, as it is thought that the depth may have tended to increase the risk of spontaneous ignition.

Death of Lord Birkenhead

Tributes from Lord Melchett and Sir Max Muspratt

LORD BIRKENHEAD, whose death took place on Tuesday at the age of 58, was one of the directors of Imperial Chemical Industries, having been elected to the Board in November, 1928.

In the course of a personal tribute, Lord Melchett states: "When, at the invitation of myself and Sir Harry McGowan, Lord Birkenhead joined the board of Imperial Chemical Industries, Ltd., I hoped to have for many years the help and assistance of one of the ablest as well as one of the most virile minds in the country. I feel sure, speaking not only for myself, but for all of his colleagues, who in the short time he was with us had learned to value his advice and judgment, that his presence will be very sorely missed."

A warm tribute was paid by Sir Max Muspratt, who proposed a resolution of condolence at a special meeting of the Liverpool Constitutional Club on Tuesday afternoon. He referred to their early political opposition in Liverpool, and their personal friendship in recent years. "In the last two years," continued Sir Max, "I have known the hand of death only too pointedly. I know when it strikes; I know where it touches; and in the last few weeks I, with great knowledge of all that Lord Birkenhead has been going through, have first seen hope come, blossoming almost into a certainty of recovery, and then, only comparatively a few hours ago, the deadly sign that we had to expect this great shock. It is not possible, at this short notice, to do anything really worthy of the brilliant man who has been taken away from among us. He has played a great part in the history of this country and Empire at the most critical period of its history."

Leeds University Extensions

Opening of New Mining Research Department

VISCOUNT CHELMSFORD, on Tuesday, opened the new Mining Department of the University of Leeds, which forms an important step in the University's extension scheme. It is a handsome building of three floors, 158 feet long and with a general width of 44 feet. On the ground floor is the main laboratory, given up to work on the preparation of coal and ore for the market, and assaying laboratories provided with the necessary equipment for tuition in analyses of coal and metals. On the first floor is the research laboratory equipped for any investigation of chemical or physical problems arising in modern mining practice. It has so far been used by that branch of the Safety in Mines Research Board dealing with improvements in self-contained breathing appliances for use in mines. Another research laboratory is set aside for the use of the Fuel Research Board, and on the next floor is the laboratory reserved for the Board in their physical and chemical survey of the West Yorkshire coalfields, undertaken at the request of the Department of Scientific and Industrial Research. On the top floor is a museum of mining exhibits.

Other extensive building work is in progress at the University. The new Physics Department is well on the way to completion, and will probably be ready for occupation next Easter. The work of excavating for the new Chemistry Department is being carried on at present, and it is calculated that it will be two years before the building is completed. Somewhat earlier than this a start will be made on the Library, which is the gift of Lord Brotherton. In another district preliminary work is taking place in connection with the new Pathological Department of the School of Medicine.

Faraday's Diary

THE Royal Institution has entrusted G. Bell and Sons with the publication of "Faraday's Diary" on their behalf. Throughout his life Faraday kept in this diary a careful record of his experimental work, and although he himself made use of it in the preparation of his published works, the diary itself has never been published. It will occupy about six or eight volumes when complete. The editorial direction and general supervision are in the hands of Mr. Thomas Martin, the general secretary of the Royal Institution, and it is hoped that two or more volumes may be ready in time for the Faraday Centenary celebrations in September, 1931.

Formation and Properties of Boiler Scale.—(II)

By Dr. Everett P. Partridge

An important investigation of the problem of Formation and Properties of Boiler Scale, by Dr. E. P. Partridge, has been published by the Department of Engineering Research of the University of Michigan (Pp. 170, price one dollar). The following extracts taken from the Bulletin (Engineering Research Bulletin No. 15, June, 1930) give some idea of the comprehensive treatment of the subject. The first instalment of the report appeared on September 20.

ZEOLITE softening systems reduce the concentration of calcium and magnesium ions in a boiler feed water by a process of exchanging them for an equivalent concentration of sodium ions. The total ionic concentration of the water is unchanged, but the concentration of calcium and magnesium ions together may be reduced to from one to three parts per million in a carefully operated plant. A boiler fed with a water softened to this degree would be subject to scale formation only after an extreme amount of evaporation with no blow-down. In actual operation, the practical limit of total dissolved solids will usually be reached before scale deposition takes place.

While from the standpoint of prevention of scale the zeolite system of softening is probably superior to any other softening system, it has two disadvantages when viewed from the standpoint of general operation. Since the total concentration of dissolved solids is not lowered by zeolite softening as it may be by carefully controlled precipitation methods of softening, increased blow-down of boilers is necessary to maintain any definite maximum concentration in the boiler; and since none of the bicarbonate content of the raw water is removed during softening, the decomposition of bicarbonate to carbonate, and the hydrolysis of the latter produce the related conditions of high akalinity in the boiler water and high carbon dioxide in the steam. While the latter condition may be improved by efficient de-aeration following zeolite softening, the ultimate alkalinity of the boiler water is not reduced by such treatment.

Counteracting High Alkalinity

Three modified systems have been developed to counteract the disadvantage of high alkalinity of boiler water from zeolite-treated bicarbonate feed-water. The first of these is a lime-zeolite system in which the bicarbonate content of the raw water is largely precipitated as calcium carbonate and magnesium hydroxide by means of a lime treatment preceding zeolite softening; the second is a zeolite-acid system involving the partial neutralisation of the water following zeolite softening; and the third is a partial softening system adapted to internal boiler-water treatment.

The use of a lime pre-treatment with a zeolite system is limited by the necessity of undertreating in order that the water passing through the zeolite silicate material shall not be decidedly alkaline, as well as by the obvious advantage of not putting in an excess of calcium ions for the zeolite to remove. While the removal of potential alkalinity is incomplete, it is sufficient in many cases to allow the maintenance of the boiler water conditions suggested for the inhibition of embrittlement. Delayed precipitation of calcium carbonate on the zeolite material must be guarded against, since this rendrs the zeolite impotent.

Te zeolite- acid system depends upon the direct addition of acid to the feed water after softening and before de-aeration. While a temporary condition of slight acidity may exist in the water before de-aeration, the removal of carbon dioxide during the later process re-establishes an alkaline condition as long as the amount of acid added is less than the chemical equivalent of the bicarbonate in the raw water. Very satisfactory results have been obtained since 1926 with a zeolite-acid installation at the Beacon Street plant of the Detroit Edison Co., where a mixture of sulphuric and phosphoric acids is used in an automatic proportioning system to neutralise approximately 50 per cent. of the alkalinity of zeolite-softened Detroit city water. During one year the system treated 151,661,000 gallons of water at an average cost of $0·0462 per thousand gallons. The use of phosphoric acid is covered by the White patents.

The third modification of the zeolite system is an arrangement for partial treatment, in which a determined fraction of the total feed water is passed through the softener, the remainder being by-passed directly to the boiler. In effect, this is equal to the addition to the boiler of a dilute solution of sodium bicarbonate. Thermal decomposition of bicarbonates in the boiler results in the precipitation of calcium carbonate which may be settled out or blown down. The ionic concentration and the ultimate alkalinity of the boiler water are both reduced in proportion to the amount of calcium carbonate precipitated and removed from the system. Control is maintained by varying the ratio of softened to raw water fed to the boiler.

Internal Systems for Conditioning Boiler Water

All of the processes previously considered are applied to the treatment of feed water before it enters the boiler. A number of systems of scale prevention are intended to operate within the boiler. These include the use of boiler surfaces of specific materials; the application of electrical systems; the addition of boiler compounds and organic colloid treatments; and the internal conditioning of boiler waters by various inorganic chemical means.

From time to time the statement appears that boiler scale will not deposit on a surface consisting of, or covered with, some specific material. Thus it has been claimed that boiler tubes of nickel steel, or chromium-plated tubes, or surfaces covered with aluminium paint, would not form scale, while, fifty years ago, various misguided operators were smearing grease on their boiler shells as a preventive measure. There is little reason to believe that any specific surface will affect the process of scale deposition, although it may have some influence on the ease with which the scale is subsequently removed. In laboratory tests at the atmospheric boiling point, conducted by the writer preliminary to the study of scale formation in the experimental boiler, it was found that calcium sulphate scales were formed in a similar manner and in comparable amounts on heated surfaces of glass and of highly polished nickel, chromium, silver, chrome-nickel-iron, and low-carbon steel, as well as on a steel surface covered with a heavy layer of oxide burned on in an electric oven at red heat.

During the study of calcium sulphate scales in the laboratory it was noted that in no case did any scale appear to be bonded in any degree to the surface upon which it had formed. The scales invariably cracked off cleanly from the surface in large pieces. What has been referred to as the "adherence" of boiler scales may be largely a combination of a bonding effect resulting from a slight corrosion of the metal surface together with the appreciable mechanical strength of the scale, and its exact conformity to any irregularities in the surface on which it has deposited.

Electrical Systems

The use of electrical circuits in connection with a boiler to prevent scale formation on the heating surfaces is probably derived from the time-honoured custom of suspending zinc plates in a boiler to inhibit corrosion. Fischer, in 1876, tested the use of both zinc plates and electrical systems and decided that ueither were of value in scale prevention. In recent years, however, patent citations and reports of remarkable results obtained with one or another of the many systems have been increasing rapidly. It should be noted, however, that practically all of the published reports have appeared in trade journals rather than in the publications of technical societies, and that the information, while generally enthusiastic, is remarkably incomplete. On the other hand, Manz has reported that out of 20 electrical scale-prevention installations surveyed, four showed good results, four indefinite results, and sixteen negative results.

The treatment of feed water by electrolysis or electro-osmosis falls outside of the present discussion. Of the systems devised for application directly to boilers in operation, there are as many variations as might be devised by ingenious inventors, attempting to circumvent the specifications of previous patents. The simplest involves merely the connection of the boiler shell to the negative end of a direct-current

line, the positive end of which is left free. Other systems depend upon the passage of a small continuous or pulsating direct current through the metal of the boiler. Still others use direct or alternating current with the boiler metal as one electrode, and as the other, tubes or flat plates suspended in the boiler water and insulated from the boiler metal. To date, no one apparently has patented the use of an inductance set-up with the whole boiler as the secondary, or the application of radio frequencies.

Two chief theories have been proposed in support of electrical systems for scale prevention: (1) The use of a small direct current with the boiler heating surfaces as cathode causes the formation on these surfaces of a hydrogen film which is said to prevent the deposition of scale in contact with the surface, or to disrupt any scale already present; (2) The use of a small direct current with the heating surfaces as cathode polarizes these surfaces and is said to prevent the approach to them of suspended particles of scale-forming materials, which in this theory are conveniently assumed to carry negative charges. Where alternating current is used, the parallel assumption might be made that these particles are maintained in a perpetual state of suspension. Neither of these theories is significant if the theory of scale formation summarised at the end of Part III of this Bulletin is even approximately correct, but since rejection on the basis of theory is neither fair nor safe, recourse must be had to the few bits of information available concerning actual operating results.

Scarcity of Reliable Information

Reliable information concerning practical tests of electrical systems for scale prevention is extremely limited. Most of the articles published have very evidently been written by interested parties rather than by impartial observers, and do not include essential data. Fischer's tests in 1876 are undoubtedly reliable for the conditions under which he worked, but no exact investigation has been published since this early date. The writer is acquainted with three investigations made privately by different public utility companies, and one made by an industrial concern, all within the past five years, which have shown negative results for the respective electrical systems tested. It is unfortunate that these tests and others of the same type are not reported in the technical literature. If electrical systems designed to prevent the formation of scale do actually exert some inexplicable influence, it would be to the benefit of all concerned to bring to light definite technical information on the matter. On the other hand, if scale prevention by electrical means is more hypothetical than actual, the credulous should be protected from its advocates. It would be greatly to the credit of the technical societies interested in boiler problems if a programme of actual tests might be undertaken under their authorisation to establish the exact status of these electrical systems.

Boiler Compounds and Colloid Treatment

The use of organic materials, presumably colloidally dispersed, for the inhibition of boiler scale is nearly as old as the problem of scale itself. Payen tells the story in 1821 of how operators in England were accustomed to add potatoes to their boilers to the amount of 2 per cent. of the feed water, thereby preventing the formation of scale. "As in the case of so many good things," he says, "this must be ascribed to chance. Some labourers on Watt's machine, wishing to cook their potatoes in the boiler, forgot them, and were astonished when, fourteen days later, as they started to clean the boiler in the customary toilsome manner, they saw the excellent effect of the forgotten potatoes."

From the modest potatoes of Watt's helpers, there have sprung innumerable compounds and specific treatments for the prevention of boiler scale. The most common type of material in these compounds is tannin extract, while various other extracts, such as those of flaxseed, seaweed, and garden vegetables, also figure prominently in contemporary patents. In many cases, the coincident use of such chemicals as soda ash or caustic soda is specified, although it is claimed that the amounts of these substances are only a fraction of the amounts necessary in a direct softening treatment. Graphite, metal powders, sodium silicate, glycerine, soap, gelatine, resins, petroleum derivatives, and an astonishing array of other substances appear, together with those already referred to, in endless permutations and combinations. A few of the formulæ are essentially humorous; others prescribe ingredients positively injurious to any boiler; a high percentage of them are frauds; and yet it must be admitted that there is a grain of truth in the frequently ridiculous claims. Certain types of material added to a boiler water do apparently exert a modifying influence.

In semi-quantitative tests, conducted with hot tubes in contact with solutions saturated with respect to gypsum at the atmospheric boiling point, the writer found quite a definite change in the scale formation on the addition of various concentrations of tannates or of agar-agar. Where scale had formed from the pure solution as a continuous deposit of large crystals up to 1·0 mm. in length, the scale deposited in the presence of the added substances was composed of very minute crystals, scarcely distinguishable at a magnification of 200 diameters. This scale, furthermore, exhibited little mechanical strength, and repeatedly flaked off from the hot surface under the influence of convection currents in the solution. Other tests in which soluble starch, casein, and gelatine were used respectively, showed less marked effects. While these investigations have not been carried far enough to justify anything more than qualitative conclusions, it seems probable that substances such as the tannates, for example, are absorbed upon a boiler surface and upon the initial scale nuclei deposited upon this surface. As soon as a crystal has been deposited, it is removed from contact with the boiler solution because of the film adsorbed upon it. Supersaturation in the fluid film at a boiler heating-surface is thus relieved, not by the growth of crystals already deposited, but by the continuous deposition of new minute crystals. The resulting structure of tiny crystals separated from each other by adsorbed films might well be expected to show poor mechanical strength, and to be readily removed from the boiler surfaces by influences too slight to affect a continuous growing crystalline scale.

Chemical Action

Another effect of various organic colloids used in boiler treatment has been studied by Sauer and Fischler. These investigators found that gelatine, agar-agar, and tannin, respectively, were hydrolysed in contact with calcium bicarbonate solutions in an autoclave at a pressure of 10 atmospheres. The acid decomposition products neutralised the bicarbonate and carbonate present, preventing the customary precipitation of calcium carbonate. Tannin added to the amount of 0·1 per cent. to a bicarbonate solution with an initial content of 286 parts per million of $CaCO_3$ completely eliminated the precipitation of solid calcium carbonate in the autoclave, due to the formation of soluble organic calcium compounds. Sauer and Fischler believe that the effect of organic colloids in scale prevention is accordingly due not so much to a colloidal as to a simple chemical action. Further investigation of the decomposition of organic substances in boiler waters would seem to be warranted.

Treatment with colloidally dispersed substances probably never entirely prevents the deposition of scale at the evaporative surfaces of a boiler in actual operation. It may, however, suffice to modify the physical properties of the scale so that the latter will be removed practically as fast as it is deposited. In a boiler operated at moderate pressures and never driven at high ratings, such treatment might actually be satisfactory; at higher pressures and ratings, however, there is too great risk involved in depending upon the casual removal of deposited material by the circulation in the boiler. While the whole matter of internal treatment with organic colloids deserves impartial investigation on both a laboratory and a plant scale, it is doubtful if this method of scale prevention has a great deal to offer to our advancing boiler technology.

(To be continued.)

Italian Sulphur Production

THE Montecatini sulphur mines in the Marches and Romagna produced 72,144 tons during 1929 as compared with 68,010 tons in 1928. The production in 1929 was limited by market conditions, but it is expected that the output on the peninsula proper will exceed 90,000 tons in 1930 and 100,000 tons in 1931. The 1929 production of the Montecatini mines, equivalent to about one-third of the output of the Sicilian mines, is not included in the agreement between Sicilian and American sulphur producers. This fact, the United States Trade Commissioner in Rome points out, will have to be taken into account when the agreement is renewed.

Synthetic Sugars

Professor Baly's Researches

An interesting article on Professor Baly's researches in the production of synthetic sugars was published in *The Times* on Monday from its "scientific correspondent," some of whose views recall the recent presidential address of Dr. Levinstein on our dependence on air, water, earth, and sunshine for the raw materials of the future.

"Will it ever be possible," the writer asks, "to imitate the activities of green plants on a commercial scale and store up the energy of sunlight in a form in which it can be used by man and beast? At present the food supply of the world rests on the activity of green plants in using the energy of sunlight to build up starches and sugars from water and the carbonic acid of the air. Animals, and man, eat green plants or their products, or the flesh of other animals which have fed on green plants, and from these sources, by oxidizing the food in their own bodies, gain the power to perform all their vital functions. The fuel of the machine of life is stored sunlight.

"The question of cost of production has not yet entered into the patient laboratory researches which have been occupying Professor E. C. C. Baly at Liverpool for several years, and the yields of carbohydrates which he has been able to synthesise from carbonic acid have been too small for analysis. But the syrup he has obtained is similar in its properties to that got by the photosynthesis of formaldehyde, and, from the oxidation of sugars obtained in that way, he has proved the photosynthesis of glucose and of fructose and has got evidence of the photosynthesis of carbohydrates of higher molecular weight. But his work is of fundamental scientific importance from the fashion in which it at once imitates and explains one of the most characteristic mechanisms of life.

Surface Action

"The analogies between the artificial and the natural photosynthesis of carbohydrates are numerous. Biological research is discovering the great part played in vital activities by what is known as 'surface action,' the peculiar electrical and chemical conditions where two different substances meet. The artificial synthesis is a photochemical action on a surface. The carbonic acid adsorbed (attached in a special electrical state) on a suitable surface in the form of a very fine powder, is irradiated. In the early experiments nickel carbonate was used, but this is now replaced by ferric oxide deposited on kieselguhr coated with aluminium hydroxide. When nickel carbonate was used the process only went on for about two hours, a kind of poisoning taking place, but with the new material the photosynthesis is continuous. A curious point is that the activity of the powders is greatest when there is between 1·31 and 2·12 per cent. of thorium oxide in the ferric oxide. The maximum yield of carbohydrate per hour so far has been 0·13 gram for 100 grams of powder. The photosynthetic activity has been found to be in proportion to the electropositive charge assumed by the powders when in suspension in water saturated with carbon dioxide, and this makes it possible to determine rapidly the activity of any powder.

Poisoning and Depoisoning

"By measuring the velocity of current along a potential gradient of 1 volt per centimetre it is possible to determine the rates of 'poisoning' of the powders by the oxygen produced in the photosynthetic reaction, and of the subsequent depoisoning by carbonic acid. The ferric oxide powders suspended in water saturated with carbonic acid maintain a constant velocity of current when kept in the dark. When exposed to light the electropositive charge becomes less, the decrease in charge depending on the intensity of the light, until a certain intensity is reached when the powder flocculates and is deposited on the bottom of the vessel. If the radiation is then stopped, the maximum electropositive charge is restored and the powder again rises into suspension. The poisoning and depoisoning actions are completely reversible, and thus, if the light be not too great, the production of carbohydrate is continuous.

"Measurements of the photosynthetic efficiency of the powders have been made with light of different wave-lengths. The efficiency increases from the blue to the red end of the spectrum, precisely as happens in the living green plant. The analogy is very striking, and it is difficult to suppose it to be accidental. There is an equally remarkable parallel in respect of the heat relations. Photosynthesis in the living plant reaches a maximum about the temperature of 36° C., but falls rapidly above and below that point. The corresponding optimum in the laboratory is about 31° C., the yield rising steadily with the temperature from 5° upwards and falling very quickly after the optimum is reached. The cause of this almost instantaneous drop has now been discovered. Suspensions of the ferric oxide powder in water saturated with carbonic acid are completely stable in the dark at temperatures up to 31, but if the temperature rises higher the powders flocculate and pass out of suspension.

"It is fortunate that Professor Baly is able to continue his investigations, apart from the remote possibility of their leading to a practical result. The extremely difficult problems of life have to be attacked from every possible point of view, and there is none more illuminating than the discovery and description of mechanisms through which life works."

"An Atom Chaser"

Sir A. Eddington's Tribute to Dalton

Sir Arthur Eddington, who received the Freedom of Kendal on Thursday, September 25, said it was John Dalton, who lived in Kendal a century and a half ago, who had started the chase of the atom. Dalton was perhaps the greatest of all chemists. He had discovered the real atom of chemistry, which had puzzled them all ever since, and chemists, physicists, mathematicians and astronomers had all been roped in in an effort to discover how it worked. "I have myself become an atom chaser," added Sir Arthur, "and can only conclude that Dalton left some germ behind in Stramongate School, Kendal, where my father taught and I was born."

Sir Oliver Lodge, who was unable to attend, sent a message of tribute, in which he said that Sir Arthur was best known to the general public as the apostle and interpreter of the great German genius, Einstein. Indeed, Einstein without Eddington would be comparatively unknown in this country. Sir Joseph Thomson, Master of Trinity, Cambridge, also sent a tribute.

The "Coley Process" Loss of £47,184

The first accounts of the Zinc Manufacturing Co., Ltd., show a loss for the initial period of working—namely, from April 19, 1929, to June 30, 1930—of £47,184. No reference (*The Times* states in a financial note) is made by the directors in their report to the results obtained, but it may be presumed that the fall in the price of zinc was the principal cause of the loss. It will be recalled that the company was formed in the spring of last year to manufacture zinc and zinc products by the "Coley" process, and that of recent years Stewarts and Lloyds have been closely identified with the developments of the process. From the profit and loss account it appears that the actual loss on trading was £38,857. The balance sheet shows that the chief item among the assets is licences at cost, £476,675. Plant and machinery and loose tools amount to £132,241, and land and buildings to £89,643. Stocks of ore and spelter, together with sundry stores, are valued at £20,338, while there are also included among the assets the preliminary expenses, £22,153; underwriting commission, and brokerage, £15,859; and development account, £26,217. The company possesses a cash balance of £166,733. Apart from the issued capital of £993,163, the only item on the debtor side of the balance sheet is the sum of £30,558 representing sums due to trade creditors and accrued liabilities. The annual meeting was held on Monday, but no reports have been published in the press.

Lord Brotherton

Lord Brotherton has been lying ill for some days at his country residence, Kirkham Abbey, York. On Tuesday it was reported that his illness was causing the members of his family some concern, and up to the time of going to press we learn that there has been little change in his condition.

The Chemical Industry of Japan

Fertiliser Producers' Appeal to Government

A comprehensive report on Economic Conditions in Japan to June 30, 1930, has been prepared by Mr. G. B. Sansom, Commercial Counsellor, and Mr. H. A. Macrae, Commercial Secretary at H.M. Embassy, Tokyo, and has just been issued by the Department of Overseas Trade (H.M. Stationery Office, 2s. 6d. net). The following is taken from the section on chemicals and chemical fertilisers.

THE extent of the market for imported chemicals and chemical fertilisers in Japan may be gauged from the following customs returns of imports during 1927, 1928 and 1929 :—

(*Values, 1,000 yen.*)

	1927.	1928.	1929.
Acetyl-salicylic acid	473	271	497
Ammonium carbonate	158	118	144
Ammonium chloride	552	616	401
Antipyrine	105	153	146
Bichromate of potash	150	170	93
,, soda	232	394	250
Borate of soda	663	644	520
Boric acid	309	296	326
Calcium acetate	1,188	1,571	1,363
Carbolic acid	497	447	147
Casein	963	834	1,622
Chlorate of potash	861	710	854
Citric acid	85	134	233
Coal tar distillates	218	382	548
Cyanide of soda and potash	413	400	345
Formalin	608	149	197
Glycerine	1,865	1,641	631
Methyl alcohol	641	753	1,175
Milk sugar	267	201	252
Naphthalene	217	136	206
Products derived from coal tar distillates	2,220	2,629	2,671
Quinine	149	268	202
Rongalite and similar reducing agents	418	943	1,167
Salicylic acid	164	297	231
Soda bicarbonate	804	704	743
Tartaric acid	218	525	204
Ammonium sulphate	32,750	36,304	48,086
Caustic soda, crude	5,699	8,201	6,004
Chloride of potash, crude	1,378	2,302	3,080
Nitrate of soda, crude	6,754	6,078	10,051
Soda and soda ash	6,543	5,163	5,310
Sulphate of potash, crude	4,241	4,494	6,673

Increasing Output

The output of the chemical and electro-chemical industry in Japan is increasing, in conjunction with the development of the hydro-electric industry. There is a growing production of the chemicals in the following list, and a surplus, exported mostly to China, of sulphur, sulphuric acid, nitric acid, bleaching powder, calcium carbide and sodium sulphide :—

	Official figures of production in 1928. Lbs.
Acetate of lime	1,067,697
Acetic acid	19,712,193
Acetone	1,184,506
Alcohol	3,136,706
Alum	9,685,229
Alumina sulphate	40,126,619
Caustic soda	63,271,194
Chloride of lime or bleaching powder	102,128,180
Compressed ammonia	2,514,400
Compressed oxygen (cubic metres)	5,662,977
Glycerine	6,433,335
Hydrochloric acid	62,223,914
Iodine	48,166
Naphthalene	7,918,551
Nitric acid	16,600,479
Soda ash	68,182,362
Sodium carbonate	4,787,004
,, silicate	12,368,500
,, sulphate	66,854,386
,, sulphide	24,607,032
Sulphur (metric tons)	70,063
Sulphuric acid	1,352,165,645 Kwan.
Ammonium sulphate	61,975,985
Calcium cyanamide, or nitroline	42,654,394
Superphosphate of lime	246,979,748

It will be noticed that one of the largest items in both the above lists is ammonium sulphate. A difficult situation has arisen with regard to this important fertilising agent. Japanese manufacturers have vastly increased their output in recent years, and meanwhile the price of imported sulphate in Japan for a time fell so low that Japanese producers appealed to the Government to impose import duties under the anti-dumping legislation which was enacted in 1920, but so far has never been applied.

There has been during the last decade a strong tendency for chemical fertilisers to displace organic agents such as oil cake and fish manure. At the expense of these latter the consumption of artificial fertilisers has risen from 31 per cent. of the total in 1927 to nearly 50 per cent. in 1930. The principal artificial agents are ammonium sulphate, superphosphate of lime and compound fertilisers.

Synthetic Nitrogen Compounds

The ammonium sulphate manufactured in Japan is produced almost entirely by synthetic nitrogen plants (Casale, Claude, cyanamide and similar processes). It is difficult to estimate exactly either present or future production, but the output in Japan, Corea and Manchuria of synthetic nitrogen compounds for 1929, in terms of tons of sulphate of ammonia, was probably just under 300,000 tons, and will increase yearly as new plants come into operation. It is stated on good authority that the total capacity by 1935 will be at least 750,000 tons, and some press reports say as much as 1,200,000. A new company, the Showa Fertiliser Co., expects to start operations shortly with a yearly capacity of 200,000 tons, and is to receive a subsidy in the shape of exemption from income and business profits taxes for three years. The Corean works of the Japan Nitrogen Co. (an enterprise on a very large scale which will, if successful, be one of the largest artificial fertiliser plants in the world) commenced production in 1930, and aims at an ultimate annual production of 500,000 tons of ammonium phosphate. Meanwhile, however, the competition of imported fertilisers, the increase in demand for compound fertilisers, and the general fall in purchasing power have struck a blow at many of these undertakings, and at present, while manufacturing capacity is being increased, output is being curtailed by 30 per cent.—a phenomenon which, for that matter, is not uncommon in Japan. The South Manchuria Railway have for the time being abandoned their plan of producing as much as 300,000 tons of sulphate at Anshan and at their projected Showa Steel Works, although they are understood to have bought patent rights and ordered machinery. Other firms, in order to dispose of surplus, are endeavouring to exploit overseas markets. The Electro-Chemical Industrial Co. (in which the Mitsui Co. is interested) are reported to have decided to manufacture cyanamide only. They are making sample shipments to Europe and America, as well as to Eastern countries, and business with Madras has already resulted.

Apart from the foregoing there is nothing of interest to record in the chemical industry during the last year, except perhaps that the Government announced in September, 1929, a subsidy to Japanese manufacturers of soda ash, and set aside in the budget for this purpose some £21,000.

An exhibition will be held in Tokyo in March-May, 1931, by the Chemical Manufacturers' Association, and exhibits by foreign firms are invited. The accompanying figures of recent dividends paid by the Association trades in the first term of 1929 may be of interest :—

	Per cent.
Celluloid	7·7
Soap and toilet goods	15·0
Artificial fertiliser	10·7
Paints and colours	9·1
Industrial chemicals	6·1
Artificial silk	8·0
Dyes	4·8
Drugs and medicines	5·0
Oil and tallow	4·6
Glass	6·8

The high rate on soap and toilet articles is noticeable.

Institution of Chemical Engineers

Programme of 1930-31 Session

An interesting programme for the coming session is announced in the *Quarterly Bulletin* of the Institution of Chemical Engineers. The opening meeting will be held in the Rooms of the Chemical Society at Burlington House, London, on Wednesday next, when a paper by Dr. S. J. Kohli on "The Effect of Surface Conditions on Heat Transmission" will be presented. In the absence of Dr. Kohli, who has returned to India to resume duty as Assistant Professor of Chemistry at the Maclagan Engineering College, Lahore, the paper will be read by Mr. S. G. M. Ure.

The President's Reception will be held on Wednesday, November 12, at the New Burlington Galleries, London.

On Friday, October 31, a public lecture will be delivered in the Institution of Civil Engineers on "The Chemistry of High Pressure Reactions," by Professor W. A. Bone, of the Imperial College of Science and Technology, well known as an authority on high pressure chemistry.

December Conference

The December Conference will be held on Thursday and Friday, December 4 and 5, the subject being "The Utilisation of Trade Wastes." The opening paper, giving a general summary of the present position, will be contributed by Mr. John B. C. Kershaw, and further papers will be presented dealing more especially with the following industries: metals, paper, textiles, tanneries, collieries, rubber, wood waste, and fibre. The addition of one or two other papers is still under consideration. A number of interesting discussions is anticipated.

The Graduates and Students Section will open their programme for the new session with a meeting on Friday, October 24, when a paper on "Lubrication as applied to Chemical Engineering" will be read by Mr. J. E. Duckham (Graduate). The paper will be followed by an informal dinner and smoking concert. On Friday, November 28, the section is to have an address on the general subject of the sources of published technical data and how they should be used. The speaker will be Mr. S. Mayne, of the Patent Office Library.

New Members

The following new members have been elected during the quarter:—Member: Edward Richards Bolton, F.I.C. (Technical Research Works, Ltd., London); Associate-Members: William Ewart Gladstone Ford (British Enka Artificial Silk Co., Aintree); William Beechey Lloyd (L. A. Mitchell, Manchester); Graduate: Eric Spencer Spencer-Timms, B.Sc. (Royal Arsenal, Woolwich).

The Chemical Engineering group has arranged an interesting set of lectures for the session, including joint meetings with the London Section on October 6, with the Newcastle Section on November 4, and with the Bristol Section on December 11. At Newcastle there is to be a visit to the Carville Power Station, and a paper on "Caustic Embrittlement" will be read by Mr. W. S. Coates.

Another instance of the practical interest which the President of the Institution, Mr. J. Archer Reavell, takes in chemical engineering education is recorded in the gift of a fractionating column to the chemical engineering laboratories of King's College, London.

Detecting Mustard-Gas

International Competition to Close in December

The International Red Cross Committee at Geneva announces that the international competition for the discovery of a detective re-agent for the detection of mustard-gas in the air, which was started on July 1, 1929, is to close on December 31. The prize offered is 10,000 Swiss francs (£400).

The competition is the first step in a Red Cross campaign for the protection of civilians in the event of war. It is to be followed, if funds permit, by other international competitions to discover, among other things, the best civilian gas mask and the best means of purifying the air in subterranean places in which civilians may take shelter during air raids.

Full particulars of the competition may be obtained on application to the International Red Cross Committee, 1, Promenade du Pin, Geneva.

Chemical and Metallurgical Corporation

Group Membership of the B.A.C.

The chemical staff of the Chemical and Metallurgical Corporation, Astmoor Works, Runcorn, have recently formed a group membership of the British Association of Chemists, and an inaugural dinner of the group was held on Friday evening, September 26, at the Waterloo Hotel, Runcorn. Seventeen members of the chemical staff, all members of the Association, sat down to dinner. Mr. Arnatt, the managing director of the company, was the guest of the evening, and Mr. Crabtree took the chair.

The chairman, proposing the toast of the guest, touched briefly upon the standing of the Chemical and Metallurgical Corporation in the life of Runcorn to-day, a standing which they all knew was due to the energy, enthusiasm and persistence with which Mr. Arnatt had tackled and overcome the difficulties which surrounded him when he took over control of the company. The Corporation had established itself in a highly competitive industry in the face of world-wide industrial depression, and the achievement was one in which Mr. Arnatt could take well justified pride.

Avoiding Stagnation

Mr. Arnatt, replying, expressed his pleasure in being present at the inaugural meeting of the works members of the British Association of Chemists. He agreed with the statement of the Chairman as to the great progress the company had made within the last few months, and quoted relative figures to show what had been accomplished. He would not agree, however, that the credit was his alone; all had done their share, for which, on behalf of the shareholders he represented, he could not express too much thanks. "At the risk of striking a jarring note at such a pleasant gathering, however," stated Mr. Arnatt, "we must not forget there is still a future before us. When a struggle has been won there is sometimes a tendency to go easy, to rest on one's laurels, and that is the dangerous time. There are always newcomers, eager, alert and fresh for attack, and above all else we must avoid stagnation, for stagnation, sooner or later, leads to defeat."

Mr. Arnatt officially welcomed two new members of the staff present at the gathering, Mr. Riley, the new head of the Research Department, and Dr. Bott.

Following Mr. Arnatt's speech, Mr. Casson proposed the toast of the works. Mr. Casson spoke of the evolution of Astmoor Works from humble beginnings, and stated that to-day they had at Astmoor a works which was from scientific, engineering and chemical engineering standpoints, probably second to none in the world.

Replying to Mr. Casson, Mr. Beesley recounted many of his experiences in other works and impressed upon his listeners the need of ever greater and greater efficiency.

Mr. Howie proposed the toast of the British Association of Chemists. The aims of the Association were really two—firstly to make the chemist a better servant of industry, and secondly to make industry a better master of the chemist. Mutual interest, mutual trust, and mutual development were the best allies to help in the fight against stagnation, a real danger stressed by the earlier speakers.

Mr. Looker, replying for the Association, gave a brief history of its origin, growth and aims. The Association expressed, perhaps better than any other society, the restless vitality of those who earned their living by the profession of chemistry, and their determination to get some place in the sun.

French Fertiliser Co.'s Expansion

The French Engrais Novo Co. showed a 30 per cent. increase in shipments of fertilisers during 1929, as compared with the previous year. The entire production of compound fertilisers by this company is estimated at around 70,000 metric tons annually. At a recent meeting an increase of the capital from 26,000,000 to 50,000,000 of francs was authorised in order to permit expansion. Two new plants have recently been completed—one at Bernes in the Seine-et-Oise, and the other at Balerue in the Herault. This company produces sulphuric acid, superphosphate, compound fertilisers, and nitrate of potash. Among the specialties of the concern are "Sangureine," a fertiliser based on dried blood; "Uretourteau," based on oil cake, and "Salpetra," which is principally nitrate of potash.

From Week to Week

PROFESSOR D. D. JACKSON is the new chairman of the American Section of the Society of Chemical Industry.

MR. GEORGE GRAY has been elected Chairman of the Chemical Engineering Group, in succession to Mr. H. Talbot, and Mr. W. A. S. Calder succeeds Mr. Gray as vice-chairman.

THE SIXTH International Exhibition of Inventions, organised by the Institute of Patentees, was opened on Wednesday at the Central Hall, Westminster, and will continue open until October 11.

THE RIDGE ROASTING FURNACE AND ENGINEERING CO. announce that on September 30 their address was changed from 2, Great Winchester Street, to 16, Devonshire Square, London, E.C.2. Telephone No. Bishopsgate 8867.

A PETITION for the winding-up of the British Acetate Silk Corporation, Ltd., presented on July 25 by Johnson and Phillips, Ltd., electrical engineers and cable makers, will be heard in the High Court of Justice (Chancery Division) on October 14.

RECENT WILLS include Mr. William John George, of Moseley, Birmingham, chemical apparatus manufacturer, of W. J. George, Ltd. (net personalty, £32,705) £39,058. Major, Sir Aston McNeill Cooper-Key, Chief Inspector of Explosives at the Home Office (net personalty, £9,462), £10,229.

THE DISCOVERY is reported from South-West Africa of large deposits of lithium, which are being mined at Marienthal, near Windhoek, and show an average yield of 4·59 per cent. of lithium oxide. Inquiries for supplies have been received from London, Hamburg, and Warsaw, through the South African Board of Trade and Industries.

ELEVEN EMPLOYEES of Pullar and Sons, dyers, of Perth, were last week presented with a sum of money each and a letter congratulating them on their completion of 50 years' service with the firm. Altogether 113 men and 33 women employees of Pullars have completed 50 years' service, and of this number 37 men and 12 women are still engaged at the works.

THE CHEMICAL ENGINEERING GROUP will open the 1930-31 Session on Monday evening next with a joint meeting with the London section of the Society of Chemical Industry in the Lecture Hall of the Institution of Civil Engineers, Great George Street, London, where a paper on "Recent Results in Structure Research of Colloids in Science and Industry" will be read by Dr. Ernst Hauser, of Frankfort.

A FATALITY occurred at the Wigg Works of the United Alkali Co., Runcorn, last week, when a workman named Thomas Kelly was killed as the result of falling from a ladder in the fertiliser department. At the inquest, where a verdict of "Death from misadventure" was returned, a representative of the firm stated that Kelly had been employed at the works for 30 years and was one of the best men they had for his class of work.

STOKE-ON-TRENT CITY COUNCIL, at their meeting last week, approved a resolution urging that, in view of the recent cases of poisoning of children in the Potteries and elsewhere by arsenic in sweets and of the great risk and danger to the public owing to lack of proper control and supervision in the sale and distribution of arsenic used for industrial purposes, the Ministry of Health be requested to take the necessary steps to ensure such control and supervision.

A COURSE of three advanced lectures in chemistry will be delivered at the Imperial College of Science and Technology, South Kensington, on Monday, Tuesday and Wednesday, October 20, 21 and 22, by Professor K. Freudenberg, Professor of Chemistry in the University of Heidelberg. The first two lectures will deal with the structure of cellulose and other polysaccharides and the constitution of lignine, and the third with researches on the constitution of lignine.

THE MARKET for disinfectants, Insecticides, and Animal Dressings in Czechoslovakia is the subject of a confidential report prepared by the Department of Overseas Trade from information furnished by the Commercial Secretary, H.M. Legation, Prague, and issued to firms whose names are entered on its special register. Firms desirous of receiving a copy should communicate with the Department, quoting reference number B.X. 6,789. A similar report has been prepared on the market for polishes and dressings in Belgium (Ref. No. 6,790).

MR. A. B. BLUNSDEN has been appointed chief chemist and general manager to the Anglo-American Asphalt Co.

A NEW PROCESS for the manufacture of rayon yarn from peat extract is reported to have been discovered in Czechoslovakia, and a holding company to exploit the rights of the process is to be formed in France.

THE TREASURY have made an Order under Section 10 (5) of the Finance Act, 1926, exempting germanium oxide and scandium compounds from Key Industry duty from October 1, 1930, to December 31, 1931.

THE DISCOVERY of a radium deposit near Wilberforce, Ontario, is announced by Dr. E. G. Richards, a Toronto X-ray specialist, who states that the samples of ore are richer in radium than the ore from the Belgian Congo.

AFTER OVER FORTY YEARS' SERVICE with Brunner Mond and Co., Ltd., Mr. John Pemberton has just retired from the post of outside manager, and has been presented with farewell gifts from the staff by Mr. G. Grossart, manager of the firm's Liverpool shipping office.

WHILE ENGAGED IN DISTILLING in the laboratory at the works of Scottish Dyes, Ltd., Grangemouth, Eric Burrows, an assistant chemist, had his face and hands severely burned through the substance with which he was working becoming solidified, choking a pipe, and causing an explosion.

THE BRISTOL SECTION of the Society of Chemical Industry held its opening meeting of the session on Thursday, when Professor J. W. Hinchley gave an address entitled "Air and Water," dealing with matters relative to hygrometry and equilibrium moisture which have caused failure in industrial operations.

AN AGREEMENT has just been completed between "B and L" Powdered Fuel, Ltd., and the Stugkohlenstaubfeuerung Patentverwertung (a company for the profitable application of powdered fuel firing patents), providing for the pooling of their respective patents in regard to powdered fuel firing and their exploitation throughout the world.

PAYMENT has been made to St. Andrews University of £3,000, bequeathed to the University by the late Mr. William J. Matheson, LL.D., Florida, U.S.A., for the institution of additional bursaries of scholarships in chemistry at the United College. It is proposed that a residential entrance scholarship in chemistry be instituted and that the existing Matheson Bursary be made tenable for one year.

THE SENATE of London University has decided to add Robert Gordon's Colleges, Aberdeen, as from September 30, to the list of institutions recognised for the purpose of issuing course certificates for the B.Pharm. degree for external students for a period of five years. Provided that three full-time assistants in chemistry, botany and pharmacy are being appointed, the Pharmaceutical Society of Great Britain has also decided to recognise the Colleges in respect of courses of instruction for the examination for a period of five years.

THE DEPARTMENT OF OVERSEAS TRADE announce that Mr. F. W. Field, His Majesty's Senior Trade Commissioner in Canada and Newfoundland, will be in attendance at the offices of the Department during the month of October and will be pleased to meet by appointment representatives of manufacturers and merchants interested in the export of British goods to Canada. At a later date he will visit a number of industrial centres in the Provinces. Applications for appointments with Mr. Field in London should be addressed to the Department, 35, Old Queen Street, London, S.W.1, quoting reference No. 3081/1/1930.

A LABORATORY, intended to instruct pupils in the distinguishing of various textiles, was opened on Monday at the London County Council School of Retail Distribution, Westminster. The school, which exists for the training of boys and girls employed in or intended for retail trades, is the first technical institute in the country to devote itself entirely to this subject, and the laboratory is the first public one of its kind. Mr. S. A. Williams, principal, states that hitherto salesmen have been forced to rely on their experience to differentiate between materials, but with a technical grounding in the laboratory they will be able to place them in a scientific manner.

Obituary

MR. W. SHERRATT, a former manufacturing chemist, of Lytham, Lancs, on September 24, aged 85.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

332,864. FERTILISERS. Soc. Chimique de la Grande Paroisse Azote et Produits Chimiques, 40, Rue du Colisée, Paris. International Convention date, November 23, 1928.

Ammonium phosphate suitable for use as a fertiliser is obtained by treating sodium phosphate with ammonia, carbon dioxide and water. Alternatively, a mixture of a sodium salt of phosphoric acid and potassium chloride, which has been allowed to react, yielding potassium phosphate or sodium potassium phosphate and sodium chloride, is treated with ammonia, carbon dioxide and water, so that the sodium in the mixture is replaced by ammonium. The product thus contains ammonium and potassium phosphates and ammonium chloride. Sodium bicarbonate is also produced in the process, and may be used for treating mono-calcium phosphate obtained from natural phosphate, to obtain the sodium phosphate required in the process.

332,868. ALIPHATIC AMINES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 27, 1928.

The vapour of a primary aliphatic amine is passed at 150°—280° C. over a hydrogenating or dehydrogenating catalyst—*e.g.*, copper, cobalt, nickel or platinum—to obtain secondary and tertiary aliphatic amines. In an example, a catalyst is obtained by reducing copper carbonate on pumice with hydrogen, and ethyl-amine vapour is passed over this catalyst at 260°–270° C., yielding a mixture of diethylamine and triethylamine and unchanged ethylamine. Butyl amine similarly treated yields a mixture of dibutylamine and tributyl amine.

332,894. CHEMICAL APPARATUS. W. Andrews, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, January 29, 1929.

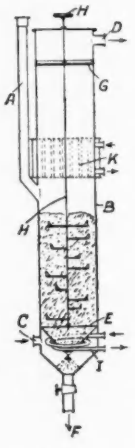
Chemical apparatus is made from copper containing a small amount of a de-oxidant such as 0·03–0·05 per cent. of phosphorus, or 0·05–0·1 per cent. of silicon, boron or cadmium. Such apparatus may be welded electrically or by gas with a composite welding rod containing an alloy of copper or silver and a deoxidant. Particulars of the welding flux are given.

332,902. ALUMINIUM OXIDE. W. W. Triggs, London. From Norton Co., Worcester, Mass., U.S.A. Application date, April 27, 1929.

Aluminous materials such as calcined bauxite are fused with carbon, iron and 3 per cent. of aluminium sulphide, preferably in a carbon-lined tapping furnace. The charge is tapped into a ladle where metallic iron separates from the aluminous product, which may also contain aluminium carbide, aluminium suboxide, metallic aluminium and ferro aluminium. The non-metallic portion, consisting of small crystals of alumina is disintegrated by saturated steam, and the fine material is dried, screened and subjected to magnetic separation. Non-aluminous metals are then separated by the action of dry chlorine at 500° C., and any remaining calcium is removed by dilute acid. The product is free from iron, silica and titanium, and may be used as an abrasive, or for the manufacture of refractories or metallic aluminium.

332,907. DYE INTERMEDIATES. D. A. W. Fairweather, J. Thomas, and Scottish Dyes, Ltd., Earls Road, Grangemouth. Application date, January 23, 1929.

The process is for the separation of mono-sulphuric esters of anthrahydro-quinones. These are obtained by way of mixed 9 : 10-diesters in which one ester group is a sulphuric ester and the other an acetyl, benzoyl or other acyl group. The corresponding anthraquinone is first reduced in the presence of a metal and a tertiary organic base, and the product treated with pyridine, sulphur trioxide and an acylating agent to obtain the sulphuric ester, and the acetyl, benzoyl, or other acyl ester respectively. The resulting mixed 9 : 10-diester is partly hydrolysed to split off the acyl group. In an example, anthraquinone is reduced in pyridine and an atmosphere of nitrogen, with zinc dust, and acetic acid, and the product treated with acetic anhydride and then with pyridine sulphur trioxide to obtain anthrahydroquinone-9-sulphuric-ester-10-acetic ester. This may be converted into anthra-hydroquinone-mono-sulphuric ester by warming with aqueous caustic soda. Another example describes the preparation of 1-(or 4-)-acetyl-amino-anthrahydroquinone-9-sulphuric-10-acetic ester, which is converted on warming with aqueous caustic soda to 1-(or 4-)-acetyl-amino-anthrahydroquinone-9-sulphuric ester. Some other examples are given.



332,910

332,910. DESULPHURISING LIQUID HYDROCARBONS. Stadtberger Hütte Akt.-Ges., and G. Feld, Nieder-Marsberg, Westphalia, Germany. Application date, February 26, 1929.

Benzene or toluene is desulphurised by treating with finely-divided copper. This is obtained by precipitating copper from its solutions by iron and then heating the precipitated metal above 100° C. without oxidation. The hydrocarbon is completely dehydrated by calcium chloride, and is passed in through an opening C at the base of a vertical tube B, and thence through the lower aperture of a trap E supporting the desulphuriser, which is stirred by a device H and surrounded by heating coils I. The desulphurised liquid rises through cooled tubes in a jacket K through a filter G to remove any copper, and is drawn off at D. Fresh desulphuriser is supplied through a tube A, and the spent material is withdrawn at F.

332,911. QUINOLINE DERIVATIVES. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 25, 1929.

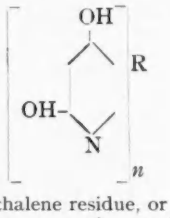
Aromatic amines are condensed with malonic esters in organic solvents boiling above 170° C., the alcohol formed being distilled off. The malonic ester may be used in excess as the solvent. Thus, α-naphthylamine is condensed with malonic acid diethyl ester to obtain 2 : 4-dioxy-α-naphthoquinoline (2 : 4-diketo-1 : 2 : 3 : 4-tetrahydro-α-naphthoquinoline), and *m*-toluidine is condensed with malonic acid diethyl ester to obtain a 2 : 4-dioxyquinoline methylated in the benzene ring.

332,917. ACETYLENE. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 24, 1929.

Acetylene is obtained from methane or gas mixtures containing at least 20 per cent. methane in an electric arc with a power of at least 50 kilowatts. The ratio of the amount of gas in cubic metres per hour passing through the arc to the power of the arc in kilowatts is preferably between 0·6 and 1·6, and the arc is operated with a continuous current, a rectified alternating current, or an alternating current of more than 50 periods. Examples are given.

332,940. DYEING. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 28, 1929.

Azo dyes are formed on the material by impregnating with a dihydroxy-quinoline of the general formula



in which R is a naphthalene residue, or a diphenyl radicle, or a residue of the benzene series containing a substituent

increasing the affinity of aromatic compounds to vegetable fibre, *n* being 1 when R is a naphthalene residue or an aromatic residue containing the above substituents, and 2 when R is a diphenyl radicle, R being free from sulphonic, hydroxy and carboxylic groups. The fibre is developed with the diazo, tetrazo or diazoazo compound not containing a sulphonic, carboxylic or hydroxy group. Coupling components specified include 2 : 4 : 2^1 : 4^1 : tetrahydroxy-6 : 6^1-diquinolyl, 5 : 6-, 6 : 7-, or 7 : 8-benzo-2 : 4-dihydroxy-quinoline, 2 : 4-dihydroxy-6-quinolyl-2^1-pseudo-azimino-benzene and 2 : 4-dihydroxyquinoline-6 : 1^1-azo-2^1-chlorobenzene. Diazo components specified include 1-amino-anthraquinone, 2-amino-diphenyl ether and several others. The preparation of the above dioxy-quinoline derivative is also described. Yellow to red shades are obtained.

332,932. Dyes. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 21, 1929.

These dyes are obtained by the combination of any diazo, tetrazo or diazoazo compound not containing sulphonic or carboxylic groups, with a 2-(2^1-hydroxy-3^1-naphthoyl-amino)-5-halogen-1 : 4-diethoxy-benzene. The latter is obtained from chloro-hydroquinone by ethylation, nitration and reduction to obtain 5-chloro-2-amino-1 : 4-diethoxy-benzene which is then treated with 2-oxy-3-naphthoic acid.

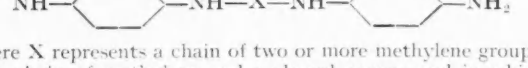
332,945-8. Fertilisers. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 29, 1929.

332,945. Urea is mixed with calcium nitrate solution and evaporated till the water content is less than 5 per cent., and the mass solidified by spraying by means of compressed air or by allowing the mass to run into a stream of air, or by rotating discs, or centrifuging.

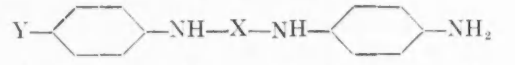
332,948. A pure solution of urea is mixed with less than 15 per cent. of substances adapted to lower the solidification point of the anhydrous melt to 120° C., and the solution is evaporated till the water content is less than 10 per cent. Suitable additions are diammonium phosphate, urea phosphate, potassium phosphates, monocalcium phosphate, phosphoric acid, nitrates of sodium, potassium or ammonium, potassium chloride, ammonium sulphate, formamide, and acetamide. The melt is sprayed, or run into mineral oils.

332,954. Dyes. Imperial Chemical Industries, Ltd., Millbank, London, and R. Brightman, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, April 29, 1929.

Dyes for regenerated cellulose materials are obtained by tetrazotising a diamine of the general formula



where X represents a chain of two or more methylene groups, or a chain of methylene and carbonyl groups and in which the phenylene rings may or may not be substituted by halogen, alkoxyl or alkyl groups, and coupling with suitable coupling components. Alternatively, the dyes may be formed by diazotising an amine of the general formula



where Y represents a nitro or acylamino group and X is as above, coupling with any component not containing a free amino group, reducing the nitro group or hydrolysing the acylamino group, again diazotising and coupling with another component. In an example, αβ-4 : 4^1-diamino-diphenyl-ethylene-diamine is tetrazotised and coupled with salicylic acid (or 1 : 8-amino-naphthol-2 : 4-disulphonic acid) and phenyl-2 : 8 : 6-acid (or β-naphthol) or with 2 : 8 : 6-acid (2 mols.). αβ-4 : 4^1-diamino-diphenyl-ethylene-diamine is obtained from ethylene dihalide and *p*-amino-acetanilide (2 mols.) and hydrolysing. Other examples are given.

332,960. Condensation Products. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 1, 1929. Addition to 320,056.

Specification 320,056 (see The Chemical Age, Vol. XXI, p. 510) describes the condensation of a hydroxy derivative of an aromatic sulphonic acid with a halogenated aralkyl halide. In this invention, a hydroxy-aromatic hydrocarbon is treated with a halogenated aralkyl halide, in the presence of a metal or metal salt catalyst, and the product sulphonated. Thus, trichloro-benzyl-chloride may be treated with phenol in the presence of zinc chloride, and the product sulphonated.

332,983. Acetic and Formic Acids. Imperial Chemical Industries, Ltd., Millbank, London, and F. D. Leicester, 128, Mill Lane, Sutton, St. Helens, Lancs. Application date, May 17, 1929.

Aqueous acetic or formic acid is vaporised and the vapour passed through a tube containing active carbon at 130° C. The concentrated acid may be recovered by heating the carbon, or by reduction of pressure, or by the action of volatile solvents. Alternatively, the adsorbed acid may be used for the production of other bodies—*e.g.*, esters by reaction with alcohols. Examples are given.

332,998. Pyrolysis of Hydrocarbons. Imperial Chemical Industries, Ltd., Millbank, London; T. S. Wheeler and J. McAulay, Winnington Hall, Northwich, Cheshire. Application date, June 4, 1929.

Ethylene is heated to 1,100° C. at a space velocity of 6,400 reciprocal minutes, whereby 30 per cent. of the gas is obtained as a light oil and the issuing gas contains 8 per cent. of acetylene.

333,016. Dyes. Imperial Chemical Industries, Ltd., Millbank, London, and M. Wyler, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, June 27, 1929.

The amino-xylenol (1-hydroxy-3-amino-2 : 4-dimethylbenzene) described in specification 331,687 (see The Chemical Age, Vol. XXIII, p. 215) is condensed with a 4-mono- or di-alkylamino-2-hydroxy-benzo-phenone-2^1-carboxylic acid, and the free carboxyl group esterified. The dyes are applied to tannin-mordanted cotton, wool, and cellulose esters and ethers, and give bright pigments when combined with phosphotungstic acid. In an example, the above amino-xylenol is condensed with 4-diethylamino-2-hydroxy-benzophenone-2^1-carboxylic acid in the presence of sulphuric acid, the product giving a bright bluish-red on tannin-mordanted cotton.

333,023. Sodium *p*-Oxyphenyl-Arsinate. Union Chimique Belge Soc. Anon., 61, Avenue Louise, Brussels. International Convention date, June 7, 1929.

This product is obtained by preparing the calcium salt of the reaction product of phenol and arsenic acid, and converting it into the sodium salt.

333,079.—Acrylic Acid Chloride. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 14, 1929.

The vapour of β-chloro-propionic acid chloride is brought at 140°—300° C. into contact with catalysts splitting off hydrogen chloride from organic compounds containing chlorine, *e.g.*, barium chloride, alumina, or bauxite, to obtain acrylic acid chloride.

333,090. Carbon Disulphide. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 24, 1929.

In the preparation of carbon disulphide, slag-like residues are left in the retort. These may be converted into masses which are easily removed by adding inert, infusible substances, such as bauxite, pyrites, ores, pumice, firebrick, clinkers, sand, or coke.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: —312,582 (Chemische Fabrik vorm. Sandoz), relating to monoazo dyestuffs, see Vol. XXI, p. 114; 312,919 (A. Boehringer), relating to pyridyl alkines and piperidyl alkines, see Vol. XXI, p. 114; 313,562 (Chemische Fabrik vorm. Sandoz), relating to polyazo dyestuffs, see Vol. XXI, p. 156; 314,060 (H. Oehme and Chemische Fabrik Kalk Ges.) relating to carbon bisulphide, see Vol. XXI, p. 179; 314,522 (Standard Telephones and Cables, Ltd.), relating to lead alloy for cable sheaths, etc., see Vol. XXI, p. 23 (Metallurgical Section); 318,107 (I.G. Farbenindustrie Akt.-Ges.), relating to vat dyestuffs, see Vol. XXI, p. 428.

Specifications Accepted with Date of Application

334,820. Aluminium alcoholates containing aluminium chloride, Manufacture of. Dr. A. Wacker Ges. für Elektro-Chemische Industrie Ges. June 13, 1929.

308,218. Basic products from imido ethers of higher fatty acids, Manufacture of. I.G. Farbenindustrie Akt. Ges. March 19, 1928.

311,336. Isatoic acid anhydride and derivatives thereof, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 9, 1928.

311,737. Hydrogen, Manufacture of. Lazote, Inc. May 15, 1928.

313,453. Highly stable sulphonic acids or their salts, Manufacture of. Oranienburger Chemische Fabrik Akt.-Ges. June 11, 1928.

313,493. Indigoid vat dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 12, 1928.

313,877. Unsaturated esters, Production of. Rohm and Haas Akt.-Ges. June 18, 1928.

317,857. Obtaining light hydrocarbons (benzines and petrols) during the low temperature carbonisation of solid fuels, Process and apparatus for. A. Meiro. August 24, 1928.

334,850. Carbon bisulphide, Manufacture of. H. Oehme and Chemische Fabrik Kalk Ges. October 2, 1928.

334,862. Vanadium catalysts for use in the oxidation of oxidisable gases. S. Robson and P. S. Lewis. June 8, 1929.

334,872. Dyestuffs and intermediates, Production of. W. Smith, S. G. Willimott, J. Thomas and Scottish Dyes, Ltd. March 5, 1929.

334,878. Stable reduction compounds of vat-dyestuffs, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*). May 11, 1929.

334,887. 2 : 4-di-(nitrophenyl)6-halogen-1 : 3 : 5-triazines, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). June 10, 1929.

334,900. Aliphatic acids and other fermentation products, Production of. H. Langwell. June 11, 1929.

334,902 and 334,921. Vat-dyestuff enolic sulphuric acid esters. D. A. W. Fairweather, J. Thomas and Scottish Dyes, Ltd. March 7, 1929.

334,919 20. Stable reduction compounds of vat-dyestuffs. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*). May 11, 1929. Additions to 334,878.

334,924. Methanol, Production of. British Celanese, Ltd., W. Bader, and E. B. Thomas. April 12, 1929.

334,926. Carrying out reactions with gases, vapours, or liquids, in which hydrogen, oxygen, or sulphur is present in the free or combined form. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). April 15, 1929. Addition to 293,077.

334,970. Metal carbonyls, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). June 24, 1929.

334,986. Acetic anhydride, Manufacture of. Imperial Chemical Industries, Ltd., H. Hepworth and F. D. Leicester. July 4, 1929.

335,007. Di-calcium phosphate, Commercial production of. A. Holz and T. van D. Berdell. July 30, 1929.

335,014. Vat dyestuffs of the anthraquinone series, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). August 7, 1929.

335,043. Vat dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 28, 1929. Addition to 318,107.

335,081. Alloys, Manufacture of. J. Gray. (*A. Pacz.*) October 7, 1929.

335,105. Aluminium alloys. Metallges. Akt.-Ges. December 7, 1928.

335,132. Alcohol free from water, Production of. Zellstoffabrik Waldhof and O. Luhrs. January 10, 1929.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Bacon, R. F. Production of sulphur from sulphides. 28,411. September 23.

Barrett Co. Operation of by-product recovery system of coal distillation plant. 28,094. September 25. (United States, September 25, 1929.)

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Apparatus for measurement of combustible gas valves. 28,330. September 22.

—— Manufacture of alkali chromates. 28,632. September 24.

—— Manufacture of anhydrous hydrofluoric acid. 28,633. September 24.

—— Manufacture of fluorine. 28,634. September 24.

—— Manufacture of sulphuric acid esters of the leuco compounds of indigoid vat dyestuffs containing nitro groups. 28,747. September 25.

Distillers Co., Ltd. Manufacture of yeast. 28,855. September 26.

Du Pont de Nemours and Co., E. I., and Marks, Baron. Resin soap lake pigments. 28,422. September 23.

Du Pont de Nemours and Co., E.I. and Imperial Chemical Industries, Ltd. Manufacture of sulphide dyes. 28,500. September 24.

—— Manufacture of sulphide blacks. 28,561. September 24.

—— Manufacture of sulphur blacks. 28,562. September 24.

Federal Phosphorus Co. Production of chlorinated diaryls. 28,000. September 24. (United States, September 28, 1929.)

—— Non-crystalline high chlorinated diaryl resins. 28,607. September 24. (United States, September 28, 1929.)

Finlayson, D. Manufacture of aliphatic compounds. 28,703. September 25.

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo-dyestuffs. 28,452. September 23.

—— Manufacture of derivatives of 1 : 4 : 5 : 8-naphthalene-tetracarboxylic acid. 28,883. September 26.

Hofwimmer, F. Production of highly-nitrated aromatic combinations. 28,255. September 22. (Austria, September 23, 1929.)

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Conversion of methane into liquid hydrocarbons. 28,282, 28,283. September 22.

—— Production of lubricating oils. 28,284. September 22.

—— Production of esters. 28,285. September 22.

—— Production of butadiene. 28,286. September 22.

—— Production of wetting agents. 28,287. September 22.

—— Treatment of textiles and agents therefor. 28,546. September 24.

—— Manufacture of colouring-preparations. 28,547. September 24.

—— Treatment of coals, tars, etc. 28,725 September 25.

—— Manufacture of metallic cyanates. 28,726. September 25.

—— Magnetic piston pumps. 28,727. September 25.

—— Manufacture of sulphuric acid esters of the leuco compounds of indigoid vat dyestuffs containing nitro groups. 28,747. September 25.

—— Storage of hygroscopic substances, etc. 28,849. September 26.

—— Manufacture of polymerisation products. 28,850, 28,851. September 26.

—— Thermal treatment of organic substances. 28,852. September 26.

I.G. Farbenindustrie Akt.-Ges. Cutting continuous artificial-fibre bands. 28,301. September 22. (Germany, November 21, 1929.)

—— Manufacture of paints, etc. 28,500. September 23. (Germany, September 23, 1929.)

—— Production of stable bleaching-powder. 28,052. September 25. (Germany, October 26, 1929.)

—— Manufacture of vat dyestuffs, 28,741. September 25. (Germany, September 25, 1929.)

—— Accelerating vulcanisation of rubber. 28,748. September 25. (Germany, September 26, 1929.)

—— Manufacture of vat dyestuffs. 28,882. September 26.

—— Dressing seed grain. 28,884. September 26. (Germany, September 26, 1929.)

—— Manufacture of 1 : 4 : 5 : 8-naphthalene-tetracarboxylic acid, etc. 28,887. September 26. (Germany, September 26, 1929.)

Imperial Chemical Industries, Ltd., and Du Pont de Nemours and Co. Compressers, etc. 28,942. September 26.

International Industrial and Chemical Co., Ltd. Barium-oxygen compounds. 28,760. September 25.

James, R. W., and Merck and Co. Preparation of absolute alcohol, etc. 28,319. September 22.

Kali Forschungs-Anstalt Ges. Production of di-calcium phosphate, etc. 28,931. September 26. (Germany, November 1, 1929.)

—— Production of ammonium carnallite, etc. 28,932. September 26. (Germany, November 28, 1929.)

Metal and Thermit Corporation. Manufacture of titanium dioxide. 28,722. September 25. (United States, September 28, 1929.)

Metallges. Akt.-Ges. Production of active carbon. 28,551. September 24. (Germany, October 4, 1929.)

Soc. des Usines Chimiques Rhône-Poulenc. Process for dissolving cellulose acetates, etc. 28,302. September 22.

—— Manufacture of sodium thiosulphate. 28,894. September 26.

Soc. of Chemical Industry in Basle. Manufacture of dyestuffs containing chromium. 28,885. September 26. (Switzerland, September 26, 1929.)

—— Dyeing animal fibres fast tints. 28,886. September 26. (Switzerland, September 26, 1929.)

Titanium Pigment Co., Inc. Manufacture of titanium pigments. 28,506. September 23. (United States, September 24, 1929.)

—— Manufacture of composite calcium sulphate titanium oxide pigments. 28,507. September 23. (United States, September 24, 1929.)

U.S. Industrial Alcohol Co. Precipitation and treatment of cellulose derivatives. 28,033. September 26. (United States, October 4, 1929.)

White, A. E. and American Smelting and Refining Co. Purifying zinc chloride. 28,601. September 24.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID CHROMIC.—1s. 0¾d. per lb. d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9½d. and 10d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3¼d. per lb. Liquor, £18 10s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised, 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4⅛d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3¼d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6d. to 7½d. per lb. Crude 60's 1s. 4½d. to 2s. per gall. August/December.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 3d. per gall. B.P., 5s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 7d. to 2s. 10d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 11d. to 2s. Dark, 1s. 6d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 1s. 10d. per gall. Pure, 1s. 11d. to 2s. 2d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6¼d. to 6⅝d. per gall. Home, 4d. per gall. d/d. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1¼d. to 1⅜d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8¼d. to 8⅜d. per gall. Solvent, 90/160, 1s. 2¼d. to 1s. 3d. per gall. Solvent, 95/160, 1s. 3¼d. to 1s. 6d. per gall. Solvent 90/190, 11d. to 1s. 2½d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £4 per ton. Whizzed, £4 to £5 per ton. Hot-pressed, £8 per ton.

NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 10s. per ton. Flaked, £11 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 6d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8¼d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8¼d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8¾d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9¼d. per lb., in ton lots.

DICHLORANILINE.—1s. 10d. per lb. f.o.r. works.

DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb., f.o.r. works.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 1d. per lb., ex works.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 to £8 5s. per ton. Grey, £14 to £15 per ton. Liquor, 9d. per gall.

ACETONE.—£73 per ton.

CHARCOAL.—£6 to £8 3s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. per gall. 16° Tw.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. to 3s. 2d. per gall. Solvent, 4s. per gall.

WOOD TAR.—£4 5s. to £5 per ton.

BROWN SUGAR OF LEAD.—£37 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3½d. to 4 1/16d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity. drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 9d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 6d.–7s. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, for ½ to 1-ton lots, delivered, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6d. to 1s. 6¾d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 9d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—8s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BISMUTH CARBONATE.—6s. 6d. per lb.
BISMUTH CITRATE.—6s. 9d. per lb.
BISMUTH SALICYLATE.—6s. 7d. per lb.
BISMUTH SUBNITRATE.—5s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 4s. 4d. per lb.
BISMUTH OXIDE.—8s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. per lb.
BISMUTH SUBGALLATE.—6s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 30 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 5½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 8d. per lb. Prices for 1-cwt. lots.
CAFFEIN.—8s. per lb.
CAFFEIN CITRAS.—6s. per lb.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 6d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 3s. to 3s. 2d. per lb., according to quantity; also special contract prices.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
EMETINE HYDROCHLORIDE.—58s. 6d. per oz.
EMETINE BISMUTH IODIDE.—33s. 6d. per oz.
EPHEDRINE, PURE.—14s. 6d. to 15s. 6d. per oz.
EPHEDRINE HYDROCHLORIDE.—11s. 9d. to 12s. 6d. per oz.
EPHEDRINE SULPHATE.—11s. 9d. to 12s. 6d. per oz.
ERGOSTEROL.—2s. 6d. per gm.
ETHERS.—S.G. ·730– 1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—27s. 6d. per oz.
HYDRASTINE HYDROCHLORIDE.—85s. per oz. for small quantities.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb., for 28-lb. lots. Green, 3s. 1d. per lb., list price. U.S.P., 3s. 3d. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¼d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 16s. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
PILOCARPINE NITRATE.—10s. 6d. per oz.
POTASSIUM BITARTRATE 99 100% (Cream of Tartar).—89s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 3d. per lb. in 28-lb. lots. Smaller quantities 1d. per lb. more.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1 cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
QUINOPHAN.—B.P.C., 14s. 6d. to 16s. 6d. per lb. for cwt. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—18s. 6d. per lb.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE.—B.P.C. 1923, and U.S.P., 2s. 2d. to 2s. 5d. per lb. for 1-cwt. lots.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—10s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 8s. 3½d. to 9s. 2d. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
ACUFINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—10s. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21 22° C.).—7s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—11s. per lb.
CITRONELLOL.—8s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. 3d. per lb.
GERANIOL (PALMAROSA).—17s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—11s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—46s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN (EX CLOVE OIL.—13s. to 15s. per lb. Ex Guaiacol.—12s. to 13s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, October 2, 1930.

THE inquiry for chemicals during the current week has continued active and shown some improvement, and the same applies to export orders.

General Chemicals

ACETONE.—In steady demand and firm at £70 10s. to £80 per ton, according to quantity.

ACID ACETIC.—Remains firm at £36 5s. to £38 5s. for Technical 80% and £37 5s. to £39 5s. per ton for Pure 80% Edible, according to quantity delivered buyers' works and in regular demand.

ACID CITRIC.—Still very slow at about 1s. 6d. per lb., less 5%.

ACID LACTIC.—The good demand continues at £41 to £42 per ton for the 50% by weight pale quality.

ACID OXALIC CRYSTALS.—Firm at £30 7s. 6d. to £32 per ton, according to quantity, with a regular demand.

ACID TARTARIC.—Continues easy at about 1s. to 1s. 0½d. per lb., less 5%.

SULPHATE OF ALUMINA.—Firm at £8 to £8 15s. per ton for the 17 18% iron free quality.

ARSENIC.—Firm at about £16 10s. per ton, free on rails the mines.

CREAM OF TARTAR.—87s. 6d. per cwt., ex warehouse London. The improved demand continues.

COPPER SULPHATE.—About £21 to £21 10s. per ton, free on rails London.

FORMALDEHYDE.—£32 per ton, ex wharf London for 40% by volume and in steady request.

LEAD ACETATE.—£38 per ton for white and £37 per ton for brown—in steady demand.

LEAD NITRATE.—Unchanged at about £29 10s. to £30 per ton.

LITHOPONE.—£19 15s. to £23 per ton according to grade and quantity.

CARBONATE OF POTASH.—£28 to £29 per ton for 96/98% arsenic free quality.

PERMANGANATE OF POTASH NEEDLE CRYSTALS B.P.—5¼d. per lb., and in steady demand.

PRUSSIATE OF POTASH.—Firm at £63 10s. to £65 10s. per ton. The brisk demand continues.

BICHROMATE OF SODA.—Firm at 3¾d. per lb., with usual discounts for contracts and in steady demand.

SODA HYPO SULPHITE.—Commercial quality £8 10s. Photographic crystals £14 15s. per ton.

SULPHIDE OF SODIUM.—£10 5s. to £11 5s. per ton for solid and £11 5s. to £12 5s. for broken, according to quantity, carriage paid.

TARTAR EMETIC.—Steady at about 11d. per lb.

ZINC SULPHATE.—Unchanged at £12 10s. per ton.

Coal Tar Products

The coal tar product market remains unchanged. There is no further drop in prices, and the market is still uninteresting.

MOTOR BENZOL.—Still quoted at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Unchanged at about 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA.—Remains at about 1s. 1d. per gallon f.o.r.

CREOSOTE OIL.—Quoted at 3d. to 3½d. per gallon f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Remains at 1s. 8d. per gallon for the 98 100% quality, and at 1s. 6d. per gallon for the Dark quality 95 97%.

NAPHTHALENES.—Quoted at £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76 78 quality.

PITCH.—Obtainable at 37s. 6d. to 42s. 6d. per ton, f.o.b. East Coast port.

The following additional prices have been received :—

ASPIRIN.—Prices are as previously with the scale unchanged at 2s. 9d. to 2s. 11d. per lb. for domestic business. Large contracts are at slightly lower rates.

SALICYLIC ACID B.P.—1s. 5d. to 1s. 8d. per lb.

MOTOR BENZOL AND SOLVENT NAPHTHA.—In view of the reduced price of petrol it is expected that some alteration will finally show itself in these commodities, but at the time of writing it is not clear what definite effect the recent reductions will have on price.

Generally speaking, prices are unchanged and business is quiet. Competition is still very keen and any substantial orders on the market are actively competed for.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—The market, like that for all fertilisers, continues dull. Merchants appear to be in no hurry to buy and sellers are holding firm at £7 to £7 5s. per ton f.o.b. U.K. port in single bags for prompt shipment, and are quoting higher prices for forward. *Home.*—Apart from the fertiliser manufacturers, some of whom are now commencing their mixing operations, there is little interest in the home market. For October delivery the price has advanced to £9 1s. per ton, delivered in 6-ton lots to farmers nearest station.

Nitrate of Soda.—There are no features of interest to report. Prices remain unchanged.

Latest Oil Prices

LONDON, October 1.—LINSEED OIL closed steady at about previous rates. Spot, ex mill, £29, nom.; October, £24 17s. 6d.; November-December, £24; January-April, £23 2s. 6d.; May-August, £22 17s. 6d., naked. RAPE OIL was inactive. Crude, extracted, £32; technical, refined, £33 10s., naked, ex wharf. COTTON OIL was dull. Egyptian crude, £23 10s., refined common edible, £29; deodorised, £31; naked, ex mill. TURPENTINE was quiet and 3d. per cwt. lower. American, spot, 34s. 6d.; November-December, 34s. 9d.; and January-April, 36s. 6d.; Russian, spot, 32s. 3d.

HULL.—LINSEED OIL, naked, closed for spot, at £24 10s.; November and November-December, £24; January-April and May-August, £23 10s. COTTON OIL.—Egyptian crude, spot, £22; edible refined, spot, and technical, spot, £25; deodorised, spot, £27. PALM KERNEL OIL.—Crude naked, 5½ per cent., spot, £24. GROUNDNUT OIL.—Crushed/extracted, spot, £27; deodorised, spot, £31. SOYA OIL.—Extracted and crushed, spot, £24 10s.; deodorised, spot, £28. RAPE OIL.—Crushed/extracted, spot, £31; refined, spot, £33 per ton. TURPENTINE, spot, 36s. 6d. COD OIL, 24s. per cwt., net cash terms, ex mill.

South Wales By-Products

THERE is very little change to report in South Wales by-product activities. Business continues to be slow and the immediate outlook is far from satisfactory. Pitch has a slightly better call, but with patent fuel manufacturers buying only for immediate requirements, stocks remain well in excess of the demand. Values are unchanged. Road tar is slightly better with values steady round about 13s. per 40-gallon barrel. Refined tars are in fair demand, with values for coke-oven and gasworks tar unchanged.

Scottish Coal Tar Products

THE recent cut in price of petrol has curtailed business in motor benzol to some extent, as producers have not yet reduced quotations in proportion. Other products remain rather quiet, although there is a slight improvement in tone.

Cresylic Acid.—Business continues quiet with quotations slightly lower. Pale, 99/100%, 1s. 9d. to 1s. 10d. per gallon; pale, 97 99%, 1s. 8d. to 1s. 9d. per gallon; dark, 97/99%, 1s. 7d. to 1s. 8d. per gallon; high boiling, 1s. 8½d. to 1s. 10½d. per gallon; all ex makers' works.

Carbolic Sixties.—Producers are holding out for about 2s. per gallon, free on rails.

Creosote Oil.—There is a continued demand for good class oils and prices are steady. Specification oil, 2¾d. to 3¼d. per gallon; gas works ordinary, 3¼d. to 3½d. per gallon; washed oil, 3d. to 3½d. per gallon; all f.o.r. makers' works in bulk.

Coal Tar Pitch.—Export business is slow, but the position is expected to improve shortly. Production is likely to increase in this area in the near future. Nominal value is 45s. to 47s. 6d. per ton f.a.s. Glasgow for export and about 47s. 6d. per ton f.o.r. for home trade.

Blast Furnace Pitch.—Although production is at a minimum, stocks are high and orders scarce. Controlled prices are unaltered at 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—A fair demand exists at about 3d. to 3½d. per gallon ex makers' works in buyers' packages.

Blast Furnace Tar.—Unchanged at 2¾d. per gallon.

Crude Naphtha.—Production is small and value remains steady at 4d. to 4¼d. per gallon, f.o.r. in bulk.

Water White Products.—Makers of motor benzol are slow to reduce in sympathy with petrol and quotations range from about 1s. 5d. to 1s. 6d. per gallon. Naphthas remain dull at 1s. 2½d. to 1s. 3½d. per gallon for 90/160, and 1s. to 1s. 1d. per gallon for 90/190; all in bulk quantities at makers' works.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, September 30, 1930.

IMPROVEMENT is still taking place in the Scottish heavy chemical market. Home and export inquiries are active, and price changes show a definitely rising market.

Industrial Chemicals

ACETONE.—B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum 1-ton lots.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1 cwt. bags, delivered free Great Britain in one ton lots and upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at the same price, viz.: 3¼d. per lb., ex store. On offer from the Continent at 3⅛d. per lb., ex wharf.

ACID, SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 1s. 1d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 2½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10¼d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £32 per ton, ex wharf. On offer for shipment from China at about £31 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or at £4 12s. 6d. per ton, f.o.b U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £33 per ton, ex store. Continental on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, c.i.f. U.K. ports.

LEAD, ACETATE.—White crystals quoted round about £39 to £40 per ton ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE.—GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £26 5s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid, buyer's station, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 2s. per ton, carriage paid, buyer's sidings, minimum six-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices, 55s. per ton, ex works; 57s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, all delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra. Crystals 2s. 6d. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £12 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Passport for German Specialist

As a protest against delay in extending a passport for a German glass specialist employed by them, Hailwood and Ackroyd, Ltd., glass manufacturers and lamp makers, Morley, decided to close their works for a week as from Monday night, about 400 workers being affected. A telegram sent by the firm to the Home Office stated that the employees were discharged definitely for one week and would remain discharged until the permit was received, "thus throwing over £400 per week extra burden on to the dole in this locality and robbing the town of a wages bill of £1,200 weekly." The Home Office's intimation that the permit was to be granted was dispatched the previous week and was received in Morley on Monday. Mr. E. Hailwood, the managing director, stated, however, that two days would elapse before the notices could be withdrawn. As to the need for employing a foreign workman, Mr. Hailwood said the firm were compelled to import highly skilled craftsmen from abroad in order to carry on certain classes of work, "because the breed of English craftsmen in many of these industries had died out or become inept."

French Superphosphate Industry

FRENCH production of superphosphates during 1929 reached 2,430,000 metric tons, divided among the various concerns approximately as follows:—Saint-Gobain, 1,050,000 metric tons; Kuhlmann, 435,000; La Bordelaise, 295,000; Usines Dior, 160,000; Établ. Chardin, 110,000; Établ. Bertrand, 80,000; Établ. Linet, 55,000; Bozel-Maletra, 55,000; others, 190,000.

La Bordelaise recently increased its capital by 20,000,000 francs, the increase to be used for the further development of production. This capital increase was entirely subscribed by the Kuhlmann company and carried with it an exchange of officers. Thus this stock participation brings about a very close liaison between La Bordelaise and Kuhlmann.—U.S. Assistant Trade Commissioner Earle C. Taylor, Paris.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, October 2, 1930.

Unsatisfactory conditions in the cotton trade continue to exercise an adverse influence on the demand for chemicals for the bleaching, dyeing and finishing industries, and, on the whole, no more than a moderate business has been put through on this market during the past week, although a fair amount of inquiry has been reported. So far as the leading heavy lines are concerned, there has been little quotable change in the price situation. In the metal compounds, however, the outlook, from the point of view of values, is still unsettled, and an easy tendency, both in lead and copper products, continues in evidence.

Heavy Chemicals

Sales of chlorate of soda this week have been on moderate lines, with current offers of this material in the neighbourhood of £24 10s. per ton. A quietly steady business is being done in caustic soda, contract quotations for which are well held at from £12 15s. to £14 per ton, according to grade. A fair inquiry is being experienced in the case of prussiate of soda, and offers in this section keep steady at from 4¾d. to 5¼d. per lb. Both bicarbonate of soda and alkali are moving off in moderate quantities, and the tendency continues firm, current offers being at about £10 10s. and £6 per ton respectively. There is a quiet demand about in the case of saltcake, and at round £3 per ton values are reasonably steady. Inquiry for sulphide of sodium is on the quiet side, although prices are much the same as at last report, the 60/65 per cent. concentrated material being quoted at about £8 10s. per ton and the commercial product at round £7 10s. Phosphate of soda shows little change on balance, and a moderate business is passing at £10 10s. per ton. There is a quietly steady demand about for bichromate of soda, current values of which are on the basis of 3⅜d. per lb., less 1 to 3½ per cent. Relatively little interest in hyposulphite of soda has been experienced during the past week, but quotations keep up in this section at about £9 per ton for the commercial grade and £15 for the photographic.

Permanganate of potash keeps fairly steady, in spite of quiet trading conditions; the B.P. quality is on offer at about 5¾d. per lb. and the commercial at 5¼d. Offers of caustic potash seem to be easy in tendency and the current quotations are no better than about £28 10s. to £29 per ton, with no big weight of business going through. There is a moderate call for yellow prussiate of potash, prices of which keep up at from 6¾d. to 7¼d. per lb., according to quantity. Chlorate of potash is quoted to-day at round £25 10s. per ton, with inquiry at the moment rather slow. A fair amount of business is reported in the case of bichromate of potash, prices of which are maintained at 4¼d. per lb., less 1 to 3½ per cent. Carbonate of potash is a slow section, and at £24 10s. to £25 per ton offers are not too strong.

Easy conditions prevail in sulphate of copper as the result of the marked weakness in the metal, and down to £21 per ton, f.o.b., has been mentioned here during the past week. Arsenic is steady at the higher level of £17 per ton at the mines for white powdered, Cornish makes, a moderate business in this material being put through. The acetates of lead are easier on balance at about £34 10s. per ton for the brown quality and £35 10s. for the white, with nitrate in the neighbourhood of £29 per ton. There is only a quiet demand about for the acetates of lime, but prices in this section are still at about £7 5s. per ton for the brown and £14 5s. for the grey.

Acids and Tar Products

A moderate inquiry for acetic acid has been reported here during the past week, with offers steady at about £37 per ton for the 80 per cent. commercial product and from £47 to £51 per ton for the glacial. Tartaric acid is weak at down to about 11½d. per lb., and the demand is quiet. Sales of citric acid are also restricted, with prices around 1s. 6d. per lb. Oxalic acid is quiet, but at £1 11s. 6d. per cwt., ex store, offers keep up.

A quiet trade is passing in pitch, with prices maintained at from 45s. to 47s. 6d. per ton, f.o.b. Creosote oil meets with a moderate inquiry, and values are fairly steady at from 3d. to 4½d. per gallon, naked, at works. Carbolic acid is quoted at round 1s. 8d. per gallon, for 60's crude, and 6½d. per lb. for crystals.

Company News

Nitrate Railways Co.—The directors have decided not to declare an interim dividend, in view of the falling off in traffics, which to date show a loss of £285,201.

The Antofagasta (Chili) and Bolivia Railway Co., Ltd.—An interim dividend of 2 per cent. is announced, less tax at 4s. 6d. This compares with 3 per cent. paid for each year since 1923.

Rio Tinto Co., Ltd.—Out of the estimated profits of the year, a half-year's dividend of 2s. 6d. per share on the 5 per cent. preference shares, and an interim dividend of 10s. per share on the ordinary shares, have been declared, payable, less income tax, on November 1.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to November 1, 1930.

Bitulor.

515,063. Class 1. Paints, varnishes, enamels (in the nature of paint), colours, distempers, japans, lacquers, paint and varnish driers, wood preservatives, wood stains, anti-corrosive and anti-fouling compositions and anti-corrosive oils. The International Paint and Compositions Co., Ltd., 31-32, Grosvenor Place, London; manufacturers and general merchants. August 2, 1930.

Realm.

515,668. Class 1. Dyes. Lilley and Skinner, Ltd., 184 to 204, Pentonville Road, King's Cross, London, N.1; manufacturers. August 27, 1930.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal" have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1 British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Egypt.—The Physical Department of the Egyptian Ministry of Public Works is calling for tenders to be presented in Cairo by October 25, 1930, for the supply of scientific instruments. (Ref. No. B.X. 6,787).

Hungary.—An agent in Buda-Pest desires to secure the representation of British exporters of shellac and gums. (Ref. No. 307).

West Riding Dyers and Colourists

Addresses on a number of topics of interest to the dyeing industry are included in the syllabus of the West Riding section of the Society of Dyers and Colourists for the coming winter session, among them an important lecture by Dr. J. Nuesslein, of the I.G. Farbenindustrie, A.G., on January 15.

The session opens on October 9, when the President of the Society (Mr. Cyril Eastman) will be the lecturer, and, after a smoking concert a fortnight later, Mr. C. P. Atkinson (Courtaulds, Ltd.) will speak on "Preparing, dulling, dyeing, and finishing of Seraceta fabrics." Then follow lectures by Mr. Peter Urmston (Mather and Platts, Ltd.) on "Modern bleaching, dyeing, printing and finishing machinery for cotton and artificial silk goods" (November 27); by Mr. C. O. Clark and Mr. Ellis Clayton on "Modern organic solvents and some of their uses" (December 18); by Dr. S. G. Barker (Wool Research Association) on "The physical relationships of the dimensional characteristics of the wool fibre and their importance in manufacturing practice" (January 29); by Mr. W. S. Siddons (Newall Insulation Co., Ltd.) on "Insulation against heat loss and prevention of condensation" (February 12); by Professor J. H. Richardson (Leeds University) on "The Gold Standard in relation to industry" (March 5); and by Mr. A. J. Hall, who has not yet selected his subject, on March 19.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Deed of Arrangement

[*The following deeds of arrangement with creditors have been filed under the Deeds of Arrangement Act, 1914. Under this Act it is necessary that private arrangements other than those executed in pursuance of the Bankruptcy Act shall be registered within seven clear days after the first execution by the debtor or any creditor. These figures are taken from the affidavit filed with the registered deed, but may be subject to variation on realisation.*]

HOPKINSON, Geoffrey Taylour, trading as MANNERS AND HOPKINSON, 82, Southwark Bridge Road, S.E., and residing at 48, Baldry Gardens, Streatham, wholesale druggist. (D.A., 4/10/30.) Dated September 22, filed September 26. Trustee, P. S. Booth, 14-17, Holborn Viaduct, E.C. Liabilities unsecured, £1,361; assets, less secured claims, £1,347.

London Gazette, &c.

Winding-Up Petitions

BRITISH ACETATE SILK CORPORATION, LTD. (W.U.P., 4/10/30.) A petition for winding-up has been presented by Johnson and Phillips, Ltd., Columbia House, Aldwych, London, W.C.2, electrical engineers and cable makers; and is to be heard at the Royal Courts of Justice, Strand, London, on Tuesday, October 14.

METAL ORE AND CHEMICAL CO., LTD. (W.U.P., 4/10/30.) A petition for winding-up has been presented by the Westdeutsche Knochenverwertungs Genossenschaft, e.G.m.b.H., Neuss, near Düsseldorf, Germany; and is to be heard at the Royal Courts of Justice, Strand, London, on October 14.

Company Winding Up Voluntarily

MACSONS, LTD. (C.W.U.V., 4/10/30.) By special resolution, September 18. N. F. Arvescough, 20, Bridge Street, Blyth, accountant, appointed as liquidator.

Notice of Dividend

MARSDEN, Tom, Wyke, near Bradford, Yorkshire, manufacturing chemist, trading as JOHN MARSDEN AND SONS. Supplemental dividend, 1s. 10¾d. per £, payable Oct. 4, Official Receiver's Office, 12, Duke Street, Bradford.

Partnership Dissolved

WYNDHAM WEST AND CO. (Harold Wyndham WEST and Tom RYLATT), colour and chemical merchants, Falcon Works, Poland Street, Oldham Road, Manchester, by mutual consent as from August 31, 1930. Debts received and paid by T. Rylatt, who will continue the business under the style of T. Rylatt and Co.

New Companies Registered

METCALFS (TAR DISTILLERS), LTD., Altham, Accrington. Registered September 25. Nominal capital, £80,000 in £1 shares. To acquire the undertakings of The John Metcalf Chemical Co., Ltd. and William Metcalf, Ltd., and to carry on the business of chemical manufacturers, dye manufacturers, dyers, bleachers, makers of acids, limes, alkalis and chemicals of all kinds, coal owners, gas and coke makers, tar producers, distillers of tar and ammonia, etc. Directors: G. C. M. Barlow, J. M. Barlow, Samuel Jackson, Sidney Jackson, G. L. Macalpine, J. L. Macalpine, F. G. Macalpine, W. F. Metcalf.

MY LADY DYES (1930), LTD., 41, Foulis Lane, Annisland, Glasgow.—Registered in Edinburgh, September 20. Nominal capital £1,000 in £1 shares. To carry on the business of manufacturers, producers, importers and exporters of, and wholesale and retail dealers in, all kinds of dyes, dyestuffs, chemicals, drugs, etc. Directors: A. Macfarlane, Miss R. Russell.

NATIONAL CELLULOSE CO., LTD., 1, Falmouth Road, Trading Estate, Slough.—Registered September 24. Nominal capital £1,000 in £1 shares. Manufacturers of cellulose, paints, enamels, and varnishes of all kinds, etc. Directors: D. M. Davies, A. H. Kaye, G. Eldridge.

WILSON PRODUCTS, LTD.—Registered September 25. Nominal capital £1,000 in £1 shares. To carry on the business of manufacturing and general chemists, druggists, drysalters, oil and colourmen, etc. Provisional directors: G. L. Waddington, 98, Horton Grange Road, Bradford; A. J. Wilson.

Tariff Changes

BRITISH HONDURAS.—As the result of an Order-in-Council, dated August 20, weed killer may be imported without payment of Customs duty.

GUATEMALA.—A monopoly for the manufacture and importation of matches and lighters of all kinds has been established as from September 10.

ROUMANIA.—The following reductions in the Roumanian tariff have come into operation provisionally as from September 15: Duty on chemical technical specialities without indication of composition, 1,600 lei per 100 kilogs. (instead of 2,250 lei); zinc white and zinc grey, 300 lei per 100 kilogs. (400); lithopone and zincolith, 320 lei (400); red lead, white lead, 200 lei (300); fine colours of all kinds, 2,500 lei (3,000).

SYRIA.—As from December 2 next, the import duties on the following articles are to be withdrawn: Chloride of calcium; acetate of lead; alum of ammonia and potash; acetic acid; sulphur; sulphide of carbon and tetrachloride of carbon; trichloride of ethylene; petroleum ether; caustic soda; litharge (minium); carbonate of soda in any form, and silicate of soda; oil of vitriol; cochineal; tannic acid; bichromates (except of soda and potash); industrial hydrochloric and sulphuric acids and fatty acids for soap-making, not containing less than 30 per cent of free acid.

A Visit to Howards and Sons' Works

THE Mayor and Corporation of Ilford paid a visit to the works of Howards and Sons at Ilford, on Friday, September 26, and were conducted over the laboratories and workshops in which employment is found for over 500 men. The visitors watched the processes by which the firm's chemical products are made and had the intricacies explained to them by five of the directors of the firm—Messrs. Geoffrey E. Howard, Bernard F. Howard, Claude F. Howard, Hugh Lloyd Howard and Dr. J. W. Blagden.

Later, while at tea, Mr. Geoffrey Howard explained some of the firm's long history. He described how the business was founded in 1794 by Mr. Luke Howard in partnership with Mr. William Allen, first president of the Pharmaceutical Society of Great Britain and later founder of Allen and Hanburys, and how ever since it had been controlled by descendants of the founder. Coming to the present, Mr. Geoffrey Howard said that in spite of the terrible trade depression he was thankful to say that the firm was still going ahead. He attributed that fact largely to the Safeguarding of Industries Act which protected them. Owing to that protection they manufactured and sold in 1929 a million pounds of chemicals, none of which had ever been produced in this country before. It was owing to that that they were able to keep the factory in full work.

Rosario Nitrate Co., Ltd.

SPEAKING at the forty-first annual general meeting of the Rosario Nitrate Co., Ltd., held at Winchester House, London, on Friday, September 26, Lord Cullen of Ashbourne told the shareholders they would be asked to approve the sale of all the assets and liabilities of the company for a certain number of preference or ordinary shares of the "Compañia de Salitre de Chile" ("Cosach"), and the liquidation of the company and the appointment of a liquidator. He was unable yet to tell them the terms upon which they would be asked to dispose of the undertaking, but as soon as possible the agreement of sale which is now being prepared would be submitted. On the general question of the advantage to the industry of this wholesale amalgamation there could, he thought, be no two opinions.

The accounts, he said, told mainly a story of accumulation of stocks. Since the date of the balance sheet the consumption of Chilean nitrate had been even more disappointing, so that in spite of the closing of the "Argentina" oficina in January last, stocks had continued to increase.

The report and accounts were adopted.